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OF THE ESTABLISHMENT
OF THE

MICHIGAN
STATE BOARD OF HEALTH

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PROCEEDINGS

OF THE

QUARTER-CENTENNIAL CELEBRATION

OF THE

ESTABLISHMENT

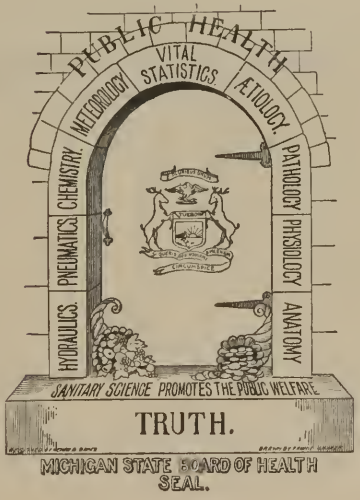
OF THE

MICHIGAN STATE BOARD OF HEALTH

HELD AT

DETROIT, MICHIGAN, AUGUST 9, 1898.

1873.



MICHIGAN STATE BOARD OF HEALTH SEAL.

1898.

[Supplement to the Annual Report of the Michigan State Board of Health.]

[Reprint No. 528]

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MEMBERSHIP OF MICHIGAN STATE BOARD OF HEALTH, 1873-1898.

Ex-members of the Board.

Homer Owen Hitchcock, A. M., M. D., Kalamazoo.
Robert Clark Kedzie, A. M., M. D., Sc. D., Agricultural College.
Zenas Emory Bliss, M. D., Grand Rapids.
Rev. Charles Henry Brigham, A. B., Ann Arbor.
Henry Francis Lyster, A. M., M. D., Detroit.
Rev. John S. Goodman, Saginaw.

Arthur Hazlewood, M. D., Grand Rapids.
Rev. Daniel Cook Jacokes, A. M., D. D., Pontiac.
Hon. LeRoy Parker, Flint.
John Harvey Kellogg, M. D., Battle Creek.
Edwin Atson Strong, A. B., A. M., Grand Rapids.

Hon. John Avery, M. D., Greenville.
Victor C. Vaughan, M. D., Sc. D., Ph. D., Ann Arbor.
Columbus V. Tyler, M. D., Bay City.
Mason Wilbur Gray, B. S., M. D., Pontiac.
Hon. George H. Granger, M. D., Bay City.

Members of the Board in 1898.

Hon. Frank Wells, *President*, Lansing.
Prof. Delos Fall, Sc. D., Albion.
Samuel George Milner, M. D., Grand Rapids.
Judge Aaron Vance McAlvay, A. B., LL. B., Manistee.

Fred Rice Belknap, B. S., M. D., Niles.
Frederick George Novy, B. S., Sc. D., M. D., Ann Arbor.
Henry Brooks Baker, A. M., M. D.,
Secretary and Executive Officer, Lansing.

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QUARTER-CENTENNIAL CELEBRATION OF THE ESTABLISHMENT OF THE MICHIGAN STATE BOARD OF HEALTH.

Concurrent Resolutions Adopted by the Michigan Legislature of 1897.

Whereas, On the thirtieth day of July, 1898, the Michigan State Board of Health will have been established twenty-five years, and the appropriate celebration of the event may be made to promote those interests of the people of Michigan for which that board was established,

Resolved by the House (the Senate concurring), That the State Board of Health is hereby authorized and requested to prepare accurate comparative statements of the conditions affecting the public health, and of the actual conditions of health in Michigan before and since the establishment of the board, especially exhibiting, if it be true, that there has been a very marked improvement in the healthfulness of Michigan in recent years, and statements of the principal dangers to life and health at the present time, also an appropriate program for a public meeting for the discussion of measures for the further promotion of the public health in Michigan, the meeting to occur on or about the time of the completion of the twenty-five years of the existence of the board.

Resolved further, That the Governor is hereby authorized and requested to send to the National Conference of State Boards of Health, at its coming meeting in 1897, which is to be held in Nashville, Tennessee, during the centennial exposition, an invitation for the National Conference of State Boards of Health, to hold its next annual meeting in Michigan in the summer of 1898 to aid in celebrating the quarter centennial of the establishment of the Michigan State Board of Health.

Resolved further, That the Governor is hereby authorized and requested to invite to this quarter-centennial meeting, Surgeon-General Sternberg of the United States Army, Surgeon-General Tryon of the Navy, Surgeon-General Wyman of the Marine Hospital Service, D. E. Salmon, M. D., of the Bureau of Animal Industry, U. S. Department of Agriculture, the officers and members of other State boards of health, and of the boards of health of the principal cities in the United States, and other distinguished sanitarians in this and neighboring countries.

Resolved further, That, in case the invitations are accepted, the Railroad Commissioner and the State Board of Health are requested to act, and to coöperate with interested citizens so far as practicable, for facilitating the attendance of representative excursionists from other States, and for placing before those who may visit Michigan on that occasion, the beauties of the numerous delightful summer resorts around the shores of the Great Lakes, and at the numerous inland lakes and other sanitaria, the general healthfulness of the State, and the unparalleled advantages of Michigan as a summer resort State.

Resolved further, That the local boards of health in Michigan be requested to send delegates to this proposed quarter-centennial meeting, in order that they may contribute, for the general welfare of the State, and that they may gain any information which they can for the use and benefit of the public health in their respective localities.

Approved June 2, 1897.

H. S. PINGREE,
Governor.

WILLIAM D. GORDON,
Speaker of the House of Representatives.

THOMAS B. DUNSTAN,
President of the Senate.

PROCEEDINGS AND ADDRESSES AT THE QUARTER-CENTENNIAL CELEBRATION OF THE ESTABLISHMENT OF THE MICHIGAN STATE BOARD OF HEALTH.

DETROIT, MICHIGAN, AUGUST 9, 1898.

[Supplement to the Annual Report of the Michigan State Board of Health for the year 1899.]

The Quarter-Centennial Celebration of the Establishment of the Michigan State Board of Health was held in accordance with Concurrent Resolutions of the Michigan Legislature for 1897. A copy of these resolutions will be found printed on the opposite page.

Arrangements for the Celebration were made through the organization of general committee of citizens of Detroit, as follows:—

THE CITIZENS' GENERAL COMMITTEE.

Chairman—Henry A. Haigh, Hammond Building, Detroit.

Secretary—Dr. E. S. Sherrill, 270 Woodward Ave., Detroit.

Members—George H. Russell, Dr. H. O. Walker, Levi L. Barbour, Dr. Leartus Connor, Dr. J. E. Emerson, Dr. Heneage Gibbes, George H. Barbour, Dr. J. H. Carstens, Dr. H. W. Longyear, Howard M. Holmes, Dr. C. W. Hitchcock, O. A. Bierce, A. A. Schantz.

The Citizens' General Committee appointed the following sub-committees:—

RECEPTION COMMITTEE.

Hon. Hazen S. Pingree, Hon. William C. Maybury, Dr. and Mrs. Leartus Connor, Dr. and Mrs. J. E. Emerson, Charles Buncher, Mr. and Mrs. George A. Steele, Dr. and Mrs. H. W. Longyear, Dr. and Mrs. W. P. Manton, Dr. Ben B. Brodie, Dr. and Mrs. E. T. Tappey, Dr. C. T. McClintock, Dr. and Mrs. Geo. E. Frothingham, Dr. and Mrs. J. K. Gailey, Mr. and Mrs. H. C. Parke, Mr. and Mrs. F. K. Stearns, Mr. and Mrs. L. L. Barbour, Mr. and Mrs. R. H. Fyfe.

FINANCE COMMITTEE.

George H. Russell, Dr. H. O. Walker, C. B. Hubbard, Dr. J. H. Carstens, Bryant Walker.

ENTERTAINMENT COMMITTEE.

Dr. Leartus Connor, George H. Barbour, Dr. H. O. Walker, Howard M. Holmes, Walter E. Campbell.

TRANSPORTATION COMMITTEE.

Col. R. G. Butler, A. A. Schantz, E. C. Brown, Blaine Gavett, J. S. Hall, O. A. Bierce, J. C. Hutchins.

PRINTING COMMITTEE.

Dr. C. W. Hitchcock, Dr. J. K. Gailey, Dr. A. H. Steinbrecher.

Those who attended the Quarter-Centennial from without the State of Michigan and those from within the State, and especially the Michigan State Board of Health have to thank the members of the various committees for the energy displayed in making the celebration the success that it turned out to be; a success from the beginning to the end, was the expression of those in attendance.

There were present: Representatives from the Provinces of Ontario, Quebec, and Manitoba, delegates from many of the State Boards of Health in the United States, the Health Commissioners of several of the leading cities of the U. S., a representative of the U. S. Government, a representative of the State Department of Michigan, presidents and members of local boards of health in Michigan, health officers in Michigan, physicians and citizens of Detroit, and members and ex-members of the Michigan State Board of Health. Each one in attendance was supposed to write his name, postoffice address, and official title in the official register for the meeting. The following is a list of those registering:—

John M. Arnold, Sec. Board of Health, Monitor Tp., West Bay City, Michigan; Dr. F. B. Adams, Health Officer, Plymouth, Michigan; Dr. William Bailey, President State Board of Health, Louisville, Ky.; Mrs. William Bailey, Louisville, Ky.; Dr. Henry B. Baker, Secretary State Board of Health, Lansing, Mich.; Mrs. Henry B. Baker, Lansing, Mich.; Dr. Fred R. Belknap, Member of State Board of Health, Niles, Mich.; C. B. Blubaugh, Pres. State Board of Health, Parkersburg, West Va.; Dr. H. M. Bracken, Sec. State Board of Health, Minneapolis, Minn.; Dr. Alonzo Bryan, Detroit, Mich.; Hon. Daniel Briggs, Ex-Supt. of Public Instruction, Lansing, Mich.; William B. Bremer, Sanitary Inspector, Buffalo, N. Y.; J. Bishop, attorney, Milwaukee, Wis.; Ann Brown, teacher, Milwaukee, Wis.; J. H. Brown, member of State Live Stock Commission, Climax, Mich.; Dr. D. D. Crowley, member of State Board of Health, Oakland, Cal.; Mrs. D. D. Crowley, Oakland, Cal.; C. J. Chaddock, Muskegon, Mich.; Dr. Leartus Connor, member of Local Committee of Arrangements, Detroit, Mich.; Dr. George H. Cattermole, State Contagious-Disease Inspector, Lansing, Mich.; Mrs. George H. Cattermole, Lansing, Mich.; H. M. Cunningham, Health Officer, Detour Tp., Detour, Mich.; Charles W. Calkins, President of Board of Health, Grand Rapids, Mich.; George H. Carlisle, Detroit, Mich.; C. L. Case, Health Officer of Thetford Tp., Clio, Mich.; Dr. J. C. Crossland, member State Board of Health, Zanesville, O.; Dr. E. W. Cooper, Pres. State Board of Health, Camden, Del.; Dr. Henry W. Cadieux, Health Officer, Grosse Point, Mich.; Dr. W. R. Chittick, Professor Detroit College of Medicine, Detroit, Mich.; M. Coad, Teacher, Milwaukee, Wis.; Mrs. C. R. Cross, Milwaukee, Wis.; Dr. C. J. Dove, Health Officer, Muskegon, Mich.; Dr. J. S. Dohany, Health Officer of Tp., Greenfield, Mich.; J. Eisenmeir, Professor, Milwaukee, Wis.; Dr. Robert G. Ellegood, Member State Board of Health, Concord, Del.; Dr. J. E. Emerson, Member of Local Committee of Arrangements, Detroit, Mich.; Dr. J. A. Egan, Sec. State Board of Health, Springfield, Ill.; Dr. James Evans, Sec. State Board of Health, Florence, S. C.; George H. Emmons, Detroit, Mich.; Mrs. Ann Emmons, Detroit, Mich.; Dr. J. H. Forest, Vice-Pres. State Board of Health, Marion, Ind.; Prof. Delos Fall, Member of State Board of Health, Albion, Mich.; Dr. John S. Fulton, Sec. State Board of Health, Baltimore, Md.; Dr. Felix Formento, Ex-President American Public-Health Association, and Ex-Member State Board of Health, New Orleans, La.; Dr. H. E.

Foster, Health Officer of Nankin Tp., Wayne, Mich.; Dr. H. Z. Gill, Sec. State Board of Health, Topeka, Kan.; Dr. R. S. Goodwin, Member State Board of Health, Thomaston, Conn.; Dr. Heneage Gibbes, Health Officer, Detroit, Mich.; Hon. Frank Wells, Pres. State Board of Health, Lansing, Mich.; S. Case Jones, Commissioner State Board of Health, Rochester, N. Y.; H. A. Gilmartin, Newspaper Reporter, Detroit, Mich.; Dr. C. W. T. Goodman, Prof. Sanitary Science, Saginaw, Mich.; Dr. A. E. Gourdeau, Health Officer, Ishpeming, Mich.; Dr. E. A. Guilbert, Member of State Board of Health, Dubuque, Iowa.; C. A. Foss, Newspaper Reporter, Detroit, Mich.; Dr. Mason W. Gray, Ex-Member State Board of Health, Pontiac, Mich.; Henry Goldmark, Asst. Eng. U. S. Board of Deep Waterways, Detroit, Mich.; Pauline Gnacke, Teacher, Milwaukee, Wis.; J. C. Harter, Sanitary Inspector, Jackson, Mich.; Dr. Charles W. Hitchcock, Member of Local Committee of Arrangements, Detroit, Mich.; Roberts P. Hudson, Time-Clerk State Board of Health Office, Lansing, Mich.; Dr. J. N. Hurty, Sec. State Board of Health of Indiana, and Secretary Conf. State and Prov. Boards of Health, Indianapolis, Ind.; F. E. Janette, Newspaper Reporter, Detroit, Mich.; Dr. W. K. Jacques, Expert Health Depart., Chicago, Ill.; Dr. H. D. Jenks, Physician, Detroit, Mich.; Dr. Charles B. Johnson, Member of State Board of Health, Champaign, Ill.; Mrs. L. C. Gower, Milwaukee, Wis.; Dr. R. C. Kedzie, Ex-President American Public Health Assoc., Michigan, Ex-President Michigan State Board of Health, etc., Agricultural College, Mich.; Dr. R. D. Kahle, Vice-Pres. State Board of Health, Lima, Ohio; Mrs. R. D. Kahle, Lima, Ohio; E. G. Kehr, Milwaukee, Wis.; Dr. S. A. Knopf, Physician to Lung Department N. Y. Nose and Throat Hospital, New York City; Mrs. S. A. Knopf, New York City; Dr. C. A. Lindsley, Dean of Medical Faculty Yale College, New Haven, Conn.; Dr. Benjamin Lee, Secretary State Board of Health, Health Commissioner of Philadelphia, Pres. Con. of State and Provincial Boards of Health, Philadelphia, Penn.; D. C. Chuenins, Professor, Milwaukee, Wis.; G. N. Lawrence, Lapeer, Mich.; C. E. Rinabury, Lapeer, Mich.; Dr. John J. Castellanos, Vice-Pres. State Board of Health, New Orleans, La.; E. J. Mealley, Supt. of City Schools, Hastings, Mich.; Dr. H. Matthey, Member State Board of Health, Davenport, Iowa; Dr. J. A. McKelveen, Member State Board of Health, Chariton, Iowa; Hon. William C. Maybury, Mayor of City of Detroit, Mich.; Hon. J. H. Morrow, Ex-State Senator, Lansing, Mich.; Dr. Samuel G. Milner, Member of State Board of Health, Grand Rapids, Mich.; Dr. Hugh McColl, Ex-Health Officer, Lapeer, Mich.; J. J. Manners, Health Officer Tp., Port Sanilac, Mich.; Dr. H. R. Mills, Health Officer, Port Huron, Mich.; R. J. Morrison, Detroit, Mich.; Theo. R. MacClure, Chief Clerk State Board of Health, Lansing, Mich.; Rev. John McCarroll, Detroit, Mich.; Hon. Aaron V. McAlvay, Member State Board of Health, Manistee, Mich.; Dr. A. J. McKillop, Health Officer of Tp., Wolverine, Mich.; Dr. F. G. Novy, Member State Board of Health, Ann Arbor, Mich.; G. A. Nettleton, Special Agent of Railroads, Detroit, Mich.; Dr. S. D. O'Brien, Health Officer, Kalamazoo, Mich.; Dr. C. O. Probst, Sec. State Board of Health, Columbus, Ohio; Hon. LeRoy Parker, Ex-President State Board of Health of Michigan, Vice-Dean Buffalo Law School, Buffalo, N. Y.; Dr. James Patterson, Chairman of Board of Health, Winnipeg, Manitoba; Jarvis C. Phillips, Milwaukee, Wis.; Dr. Elzear Pelletier, Sec. Prov. Board of Health, Treas. Con. of State and Prov. Boards of Health, Montreal, Quebec; Mrs. M. A. C. Patterson, Sec. Hancock School Mothers' Club, Detroit, Mich.; Dr. Arthur R. Reynolds, Health Commissioner, Chicago, Ill.; A. G. Rice, Local Health Officer, Woodstock, Canada; Dr. George E. Ranney, Lansing, Mich.; Dr. Byron Stanton, Member State Board of Health, Cincinnati, Ohio; Dr. Q. O. Sutherland, member State Board of Health, Janesville, Wis.; Dr. Gardner T. Swarts, Sec. State Board of Health, Providence, R. I.; Dr. Theo. Schmalzriedt, Health Officer Springwells Tp., Woodmere, Mich.; Dr. D. E. Salmon, V. S., Chief of Bureau of Animal Industry, Washington, D. C.; T. B. Scott, Health Officer, Vernon, Mich.; Dr. M. C. Sinclair, Member of Local Board of Health, Grand Rapids, Mich.; Louis A Safford, Representative Associated Press, Detroit, Mich.; Dr. E. B. Smith, Professor Michigan Medical College, Detroit, Mich.; Dr. B. R. Hoyt, Detroit, Mich.; Dr. J. S. Shoemaker, Health Officer, New Lathrop, Mich.; B. F. Schellberg, Detroit, Mich.; E. H. Sellers, Detroit, Mich.; Mrs. E. H. Sellers, Detroit, Mich.; Miss M. Sellers, Detroit, Mich.; Dr. Edwin S. Sherrill, Member of Local Committee of Arrangements, Detroit, Mich.; Dr. Mary Thompson Stevens, Detroit, Mich.; Dr. Rollin Stevens, Detroit, Mich.; Dr. U. O. B. Wingate, Sec. State Board of Health, Milwaukee, Wis.; Dr. Ernest Wende, Health Commissioner, Buffalo, N. Y.; Dr. C. L. Wilbur, Chief of Division of Vital Statistics, Lansing, Mich.; Dr. Bion Whelan, Health Officer, Hillsdale, Mich.; Dr. Frank B. Wynn, Indianapolis, Ind.

LETTERS OF REGRET.

THE JOHNS HOPKINS HOSPITAL, NORTH BROADWAY,
Baltimore, Maryland, July 29, 1898.

HENRY M. HURD, M. D., Superintendent.

Hon. Hazen S. Pingree, Governor of Michigan, Lansing, Michigan:

DEAR SIR:—I write to acknowledge with thanks the reception of your invitation to be present at the quarter centennial celebration of the establishment of the Michigan State Board of Health. I regret exceedingly that my duties and other engagements will not permit me to be present. Until my removal from Michigan nine years ago I knew the members of the State Board of Health personally, and had a deep appreciation of the value of their unrequited services to the State. Since I came to Maryland I have been constantly impressed with the recognition which the work in Michigan receives from other States. The sanitary work in Michigan has served as a model in many respects for other States. The personnel of the State Board of Health has always been admirable, and the work of the Secretary deserves great praise. I congratulate the State of Michigan through you upon its quarter century of efficient work.

Very respectfully,

HENRY M. HURD.

Letters similar to the foregoing, addressed either to His Excellency the Governor or to the Secretary of the State Board of Health, were received from the following named persons:—

William Abbott, Sec. City Board of Health, Binghampton, N. Y.; Dr. L. Adelsberger, Pres. State Board of Health, Waterloo, Ill.; Hon. John Avery, M. D., Ex-Pres. State Board of Health, Greenville, Mich.; Dr. William Curtiss Bailey, Las Vegas, New Mexico; Dr. Preston H. Bailhache, Surgeon U. S. Marine Hospital Service, Washington, D. C.; Dr. A. N. Bell, Editor of "The Sanitarian", Brooklyn, N. Y.; Dr. John S. Billings, Deputy Surgeon-General U. S. A., (Retired), New York; Edwin Farnham, Sec. City Board of Health, Cambridge, Mass.; Dr. A. L. Gihon, Ex-Surgeon U. S. Navy (retired), New York City; Paul Gerhard, C. E., New York City; Edmond Godschaux, Sec. City Board of Health, San Francisco, Cal.; Dr. Arthur Hazelwood, Ex-Member State Board of Health, Grand Rapids, Mich.; Dr. Frederick L. Hoffman, Newark, N. J.; Dr. J. L. Hess, Health Officer of Cleveland, Ohio; Dr. M. D. Hoge, Jr., Richmond, Va.; Dr. Walter Kemster, Health Commissioner, Milwaukee, Wis.; Dr. E. P. Lachapelle, Pres. Prov. Board of Health, Montreal, Quebec; Dr. J. N. McCormack, Sec. State Board of Health, Bowling Green, Ky.; Dr. J. E. Monjaris, San Luis Potosi, Mexico; Dr. F. Montizambert, Supt. Canadian Quarantines, Toronto, Ont.; John McCay, Chief Clerk Board of Health, Philadelphia, Penn.; Dr. Joseph Porter, State Health Officer, Jacksonville, Fla.; Estelle Reel, Sec. State Board Corrections and Reform, Cheyenne, Wy.; Prof. F. C. Robinson, Pres. State Board of Health, Brunswick, Me.; Salem Board of Health, Salem, Mass.; Dr. Baxter T. Smelzer, Sec. State Board of Health, Albany, N. Y.; Dr. Stephen Smith, New York City; Dr. H. K. Snow, Sec. City Board of Health, Oakland, Cal.; Dr. E. L. Standlee, Pres. Board of Health, St. Louis, Mo.; Dr. Max C. Starkloff, Health Commissioner, St. Louis, Mo.; Hon. Frank Sternberg, Governor, Boise City, Idaho; Dr. George M. Sternberg, Surgeon-General U. S. Army, Washington, D. C.; Prof. E. A. Strong, Ex-Member of State Board of Health, Ypsilanti, Mich.; Dr. E. Liceaga, President Superior Board of Health, Mexico City, Mexico; Dr. W. K. Van Reypen, Surgeon General U. S. Navy, Washington, D. C.; Dr. H. P. Walcott, Pres. State Board of Health, Boston, Mass.; Dr. Irving A. Watson, Sec. State Board of Health, Concord, N. H.; Dr. William C. Woodward, Health Officer, Washington, D. C.; Dr. Walter Wyman, Supervising Surgeon General U. S. Marine Hospital Service, Washington, D. C.; Dr. A. G. Young, Sec. State Board of Health, Augusta, Maine; Franklin Staples, M. D., Health Office, Winona, Minn.; Dr. Tobias Nunez, Medical Inspector, Mexico City, Mexico; Dr. Henry Mitchell, Secretary State Board of Health, Asbury Park, N. J.

Morning Session, Tuesday, August 9, at 9:30.

The morning session was called to order by the chairman of the meeting, Hon. Frank Wells, President of the State Board of Health, and, after prayer by Rev. John McCarroll, M. D., Mr. Wells read the following address:—

OPENING ADDRESS.

BY HON. FRANK WELLS, PRESIDENT OF THE STATE BOARD OF HEALTH, LANSING, MICHIGAN.

The Michigan State Board of Health greets most cordially today all who are here to celebrate the twenty-fifth anniversary of its birth, and to rejoice with it over the achievements of Sanitary Science during the period of its existence. You have come from near and from far, at the invitation of the State, which, twenty-five years ago called into existence this Board and whose people have since that time sustained it in its efforts to save human life and prevent human suffering. Engaged, as nearly all of you are in labors similar to these, the Michigan State Board of Health feels assured of your sympathy, and that you will today rejoice with it at any success which may have crowned its efforts during the quarter of a Century which has witnessed its activities.

Nature divides time into days and years. We order our lives to accord with these divisions in the ordinary routine of their progress, while recognizing that it is the events with which they are filled, instead of the number of days and years which mark their existence, that exhibit what these lives have been, and what they express. This is not alone true of individuals. It is equally true of society and of every organization of human beings, for whatever purpose it may have been created. Mankind does not estimate the value of a period by the number of its years, but by the importance of the events with which these years have been filled. Measured by this standard, the century just closing must be regarded as of more value than any equal number of years within the experience of the race. It is a Century which has revealed to mankind secrets concerning nature and her laws, of the greatest interest and importance. The Centuries immediately preceding this witnessed the growth of new political ideas and theories of government, and the emancipation of mankind from conditions of vassalage and priestly thraldom, to independence and civil and religious liberty. Important and far reaching in their practical effects as were these steps in human progress, yet it is doubtful if their influence in the promotion of the happiness and well being of the race, can equal the achievements of our own Century.

It is a Century which has enlightened mankind concerning mysteries which previous ages have vainly sought to solve. It is a Century during which inventive skill has most wonderfully utilized the forces of nature for man's convenience and comfort, and has perfected those marvelous instruments which have enabled us not only to contemplate the myriads of worlds which surround us, but have revealed to us a

kingdom of nature within our own world, of which before we had no conception. It is a Century which has given to the world investigators in every realm of scientific inquiry, whose ability, industry, and success have never been equaled. Their labors have led to generalizations and doctrines which have profoundly affected our conceptions of natural phenomena, and influenced philosophies and views in nearly every department of human thought.

The last quarter of this greatest of all the centuries, contemporaneous as it is with the period during which the Michigan State Board of Health has had an existence, is notable for the development of two sciences, biology and sanitation. Had the entire century nothing more to offer than those two coördinate branches of knowledge, it might still retain its rank in the world's march of progress.

The application of this knowledge to the saving of human life and the prevention of human suffering, has kept misery and despair from entering countless homes. It has dictated methods of treating the wounded upon the battle field so successful that, in the camps and hospitals of our soldiers, very much of the loss of life has been prevented, and the horror of war dispelled. It is a quarter-century filled with victories over humanity's most relentless foes, and of knowledge concerning their character and methods of warfare.

You have been invited, gentlemen, by the Legislature of the State of Michigan, through its Governor, to celebrate today the twenty-fifth anniversary of an event, the creation of the Michigan State Board of Health. It will be difficult for you who are so familiar with the sanitary achievements of the last twenty-five years to commemorate this event without having in your thoughts those remarkable developments which, during this brief period, have evolved the science of sanitation. With the day will necessarily be associated in your minds an era of progress in sanitary knowledge of far greater value than were all the ages which preceded it. It is well on this day to celebrate such an era, and to recall the accomplishments of those men whose genius and labors have in such large measure made them the saviors of their race.

Every true American heart thrills today at the achievements of our soldiers upon the field of battle, and of our sailors upon the sea. Their names become household words, and every lip speaks their praise.

Our pride is heightened by the knowledge that it is the cause of humanity which inspires these heroes to deeds of valor and courage. It is to save human lives, and to relieve human suffering, that they have taken up arms, and are offering their own lives upon the altar of humanity. As we rejoice at their successes, and admire their heroism, let us not forget those who in other ways have labored to save life, and to prevent suffering. The honor and applause which everywhere greets the warrior who is moved by patriotism and duty to noble deeds, is justly due to Dewey, to Shafter, to Sampson, to Schley and to Hobson. A grateful people is placing their names high up upon the scroll of glory and of fame. Shall we not place side by side with these, to be equally remembered with gratitude, the names of Pasteur, of Lister, of Koch and of Roux?

Achievement in any field is exalted by high purpose, and, while mankind will always honor the true soldier, it will never cease to remember with gratitude the good samaritan.

The Michigan State Board of Health is one of the pioneer organizations of its kind in the United States. The friends of the law which created it, must have been inspired by hope, rather than faith, in making investigations concerning the causes of epidemics, one of its duties. The mystery surrounding these causes twenty-five years ago was well nigh as impenetrable as it always had been. Knowledge concerning epidemics was then almost entirely empirical. It was known that many diseases were communicated by contact, and that one attack of either of these diseases usually secured immunity from subsequent attacks. Vaccination for Small-pox had been proved to be efficacious, and that disease had therefore largely ceased to menace the world with its horrors. Authorities had scarcely taken a step in the direction of stamping out any of the other communicable diseases, nor had science revealed their causes, or taught us what diseases properly belonged to this class. Scarcely a glimmer of the light which was to illumine these problems, and create the twin sciences, biology and sanitation, was then visible.

The Michigan State Board of Health entered upon its existence before the sanitary knowledge now regarded as elementary had been revealed.

It was five years after this event that Pasteur announced to the world his discoveries concerning Anthrax, and it is from this date only, 1877, that what was afterwards styled the germ theory of disease, may be said to have had an existence. From then, until now, a vast expanse of knowledge concerning the cause and prevention of a large portion of the diseases which afflict humanity, has been opened to our view. Others will today remind you of its extent, and of the full significance of this epoch of sanitary learning and achievement.

In inviting prominent sanitarians from abroad to come to Michigan, the Legislature expressed a desire that they be shown some of the numerous and beautiful summer and health resorts of the State, and learn of their value in the restoration of health, and the promotion of comfort and pleasure.

Michigan is rapidly becoming famed for these resorts, and thousands annually visit her shores from other States and countries, to enjoy her charming and varied scenery, to be stimulated by her pure and invigorating breezes, or to be restored to health by her waters of absolute purity, or by those whose medicinal value have long been unquestioned.

Michigan's peculiar insular position gives her a coast line of remarkable extent. It equals in distance the entire length of the United States, from the most northern point in Minnesota, to the most southern in Texas. The Great Lakes which form nearly her entire boundaries, are the theatre of a commerce which rivals that of the ocean. The spectator upon these waters, or upon her shores, beholds a never-ending panorama of marine architecture. The lordly passenger steamer, the freight steamer with its line of consorts, the private yacht with its dainty appointments, the screeching tug, and the white-winged sailing vessels, of every size, and for every purpose, are never absent from view. They lend to these vast inland seas that touch of life, and man's supremacy, which complements nature, and gives to each picture an ideal perfection. Innumerable islands arise from the bosom of these waters, and add to their charm the picturesqueness of beautiful and varied foliage, or of towering rocks, eroded by time and the elements, into varied and fantastic forms.

The shores of the mainland present great variety of vegetation and rocky cliff. Cities, villages and farms, diversify the landscape, and exhibit the homes of a people whose intelligence, thrift, and hospitality, are nowhere excelled. Wherever upon these shores nature presents unusual attractions, will be found the cottage of the seeker for health, recreation, or enjoyment.

Men filling all the professions, and those representing every department of business activity, students and teachers in every realm, with their families, crowd our steamers and railroad cars, to occupy, during the months when the heat of summer is elsewhere so depressing, these novel and attractive homes. Here they find tonic in the dustless air sent freshly from the northland over Superior's vast expanse. The ills and worries of life are forgotten, the steps of age or infirmity become elastic, the eye brightens, the pulses thrill, and the heart responds to the laughter of childhood, as it gambols in the waters upon the shelving sands.

The inland lakes present their own peculiar scenes of beauty, and the beholder finds it difficult to decide, often, whether the larger or the smaller lakes offer the greater attraction.

To the State which nature has so lavishly endowed with these health and pleasure giving attractions, and to this beautiful city which is the gateway to them all, you are to be welcomed by distinguished citizens of the commonwealth.

The welcome of the State Board of Health, to the many distinguished sanitarians who honor it by their presence today, is most earnest.

It hopes your visit to the State will be agreeable and profitable, and that you will remain within our borders long enough to appreciate the truth of the motto on Michigan's crest: "If a beautiful peninsula you would behold, look about you"!

Chairman Wells—Your welcome to Detroit, ladies and gentlemen, will be expressed by one of its most distinguished and popular citizens. I take great pleasure in introducing Hon. William C. Maybury, mayor of the city.

ADDRESS OF WELCOME.

BY HON. WILLIAM C. MAYBURY, MAYOR OF DETROIT, MICHIGAN.

Mr. Chairman, Ladies and Gentlemen:

It affords me very great pleasure to welcome to Michigan and to Detroit this assemblage, with its philanthropic purposes. I can but believe that the legislature showed great wisdom when it designated Detroit as the meeting place for the sanitary scientists, and as the most proper place in which to celebrate the Quarter-centennnial of the Michigan State Board of Health.

Detroit is a beautiful city, and to this is added the fact that it is a healthful city. We have a fair quota of physicians all eminent in skill; but their labors are not confined to ministering to disease, for the conditions of life are such here that they are more largely engaged in making the strong stronger and the healthy healthier. It is well recognized that there are only two principal causes of death in Detroit—one is unavoid-

able accident, and the other extreme old age. If there were any antidotes against these it might be truly said that immortality characterizes life in Detroit.

At present there is no contagious disease of any kind in our city. Our health officer, who will address you later, will give you every assurance that your environment is one absolutely foreign to disease. There is another element essential to healthy conditions, and that is fresh air. This we have in abundance, and to cap the climax, we have passing in vast volume in front of our city one of the most beautiful of rivers, whose waters are conservative of both health and cleanliness.

A few days ago there assembled in our city the official representatives of many cities. One of the questions most discussed by their assemblage was that relating to the disposition of garbage. When the convention realized that through our system of public and lateral sewers all the fears of the effects of night soil and the absence of sewage was dissipated, and in the careful collection of the garbage of the city, and its incineration a few miles therefrom was the full solution of all our difficulties and dangers, there was manifested great surprise. As we listened to the discussion of representatives of other cities as to the great difficulties they had in sewage, in many cases surface, and the difficulties of properly collecting and disposing of garbage, we in Detroit could but feel that we were peculiarly blessed. There was one suggestion which I made officially and which I renew, and that is my unalterable opposition to the farming out to any private individual of anything which relates to the health of the people. The taxes of the individual are paid in part to secure immunity from disease, and the strong arm of the government should never relax its power or vigilance in this most important matter. It is hardly a sufficient answer to one who has suffered through foul drainage or the putrifying of garbage, that some individual contractor has not done his duty. This duty is too important to be farmed out, and the individual very properly looks to the city for relief.

I welcome you to this city individually and collectively, and because we are all deeply interested in the purpose of your coming. It has been my pleasure in the past to welcome many organizations of men coming here for the accomplishment of various purposes. Indeed, the conferences have been most varying. Some have come for political purposes only, others have come here in the interest of finance, and we have had conventions here of those who are met to discuss the best way of caring for those who are to be prepared for sepulchre. Our welcome to you is especially hearty because your coming is wholly humanitarian, and we know that as a result of your conference we will all have gained more knowledge of the best means and methods for the preservation and protection of public as well as individual health.

In the quarter-century of life of Michigan's State Board of Health how wonderful have been the changes witnessed. How primitive in those early days were the means provided and plans adopted for the conservation of public health in the State and in its several cities. Then we had the omnipresent marsh, the primeval forest, and malaria and ague as a natural consequent. Under present conditions these have largely disappeared, and Michigan has come to be known as a most desirable State for one who is seeking health and its attendant blessings. The ratio of deaths has diminished very largely since that day, and multi-

tudes of lives have been prolonged through the splendid achievements of modern sanitation. That the Michigan State Board of Health has participated in these successes cannot be gainsaid; and so we assemble here today for the purpose of giving proper credit to the valuable work accomplished, and to express the debt of gratitude which we owe to those who have been and are now foremost in the work of the board.

In all the world's ongoing in the past, men have known too little of each other. There was a spirit of selfishness existing that obliterated every other consideration. Men passed each other as ships pass in the night. If I may be permitted to borrow this simile from a most excellent sermon preached by our reverend friend present (Dr. John McCarroll), and which left a deep impress upon my mind, "The ship that passes in the night shows but a flash of light, and then she disappears in the darkness. She may be laden with the richest blessings, but she showers none of them upon those whom she passes. She makes no exchange of cargo to a passing ship. Those from the shore who see her for a moment may be both hungry and thirsty, and she may carry that which may be of inestimable blessing to them, but she goes silently on her disappearing way." So men in the past carried the rich secrets of health, and of experience, and of happiness in the generations that have gone. The Edisons, the Teslas and the Humboldts of the early world passed in the night. They never dipped their colors to one another, nor exchanged their secrets. Today these ships pass as ships pass by day. They exchange their rich cargoes; they show the port of their destination; they realize that although both are going by different passages they are all aiming to arrive at that one great port known as the port of the world's ongoing—the port of the world's common prosperity. The day of selfishness as allied with success in life has passed. The measure of individual success today is in the ratio of unselfish labors done for others. It is the day when no man can rejoice in his wealth if gained at the expense of another's poverty or pain. It is the day of reciprocity and of exchange. It is this purpose that has brought you together. Here there will be an exchange of ideas and an exchange of experience—each to be benefited by the wisdom of the other. You come to give, and you come to receive, and in this reciprocal spirit the noble cause you represent will be advanced and elevated.

In this age it is the aim of municipal government particularly to reach with benefit all classes and conditions; and to see that all, both rich and poor, fortunate and unfortunate, enjoy their share of the privileges which wise government confers. No blessing or benefit is conferred by government if we have not that which protects health and stands sentinel against disease, both moral and physical. In this generation municipal government has become so far paternal that it is exerting itself in every direction to alleviate the conditions of poverty and suffering. Many cities of the old world, such as Glasgow, Birmingham, London and Vienna, have extended the powers of government even to the extent of wilfully destroying filthy abodes, and erecting upon their foundations comfortable and cleanly homes. These homes, humble though they are in all their appointments, are built under the best sanitary conditions known to the times. New York city has completely cleaned out that crime and disease-breeding spot known as "The Five Points". Tenement houses plainly but substantially built, more especially respecting the health of the community, stand on this fateful spot. Schools of manual train-

ing, which include a practical course in the modes and means of keeping cleanly in person, have been established. Children are inspired with the thought that there is sweetness in life—that there is beauty and dignity in cleanly living which they never experienced before.

A criminal who had sojourned for years at Sing Sing prison returned to his home at Five Points, and was astonished to see the changes that had taken place in his absence. With the change in material things in and about his favorite haunt there was a notable change for the better in the people that inhabited it. A light dawned upon his soul, and he turned away from these changed conditions, determined to make a like change in his own life, to forget the prison and the prison garb, and to plant his feet in the paths that lead to duty and righteousness.

The lessons of history and experience teach us, that material prosperity is not all that contributes to the better life of the community and of its people. They may enjoy great commercial prosperity and yet be upon the verge of ruin. If the moral well-being of the community is not advanced side by side with the material, moral disease will insidiously sap the city's life. The free cities of Greece were never so prosperous as when they fell an easy prey to the sword of Philip of Macedon; Rome was never so beautiful, nor was she blessed with a better water supply —great military roads leading out into all the nations of the earth—as when Cæsar crossed the Rubicon and crowned himself Emperor. It often happens, also, that communities become a prey to diseases whose course cannot be interrupted. The eloquence of Demosthenes could not save Greece; the valor of Hannibal could not save Carthage; all the statecraft of Marcus Antonius could not prevent the dissolution of the Roman Republic, while there is no picture in all history so deeply pathetic as that which shows one who, Himself the Saviour of Mankind, would not and could not save a city dying from moral and spiritual indifference. The aged Apostle St. John, when permitted a vision of the Heavenly City, describes its symmetry and completeness in these words: "And the length of it, and the hight of it, and the breadth of it were equal". So in every city that would be perfect there must be a coördination between its commercial, moral and spiritual forces.

To this city of our affection I again bid you a hearty welcome. You will travel far to find a city that manifests greater thrift or more that is homelike, than the city in which you are now assembled. There is no city of its size in the world where a larger proportion of the land belongs to the people. The houses are in every sense homes. This statement is true, whether it applies to the palace or the cottage home owner. You will not fail to note the evidence of ownership in the garden planted with vegetables for the table; in the vines that clamber over the doors; in the flowers that trail above the window; in everything and everywhere there is that which is significant of ownership, of thrift, and of home.

We may well ask the question—why should not Detroit be a magnificent city? Consider all her natural advantages—the beautiful river and the island park both creations of nature with all that is ideal in natural beauty! Nature has done so much for us that we can only claim the wisdom of making fair use of that which she has so abundantly provided.

Let me, by an incident that occurred at one of our early missionary stations, emphasize the spirit of your welcome. It is said that one of the early Jesuit Missionaries, worn out from his labors, stood under a spreading oak on a hot June Sabbath morning, preaching the gospel of peace

to the half-naked children of the forest as they sat upon the ground, encircled around him. It was manifest that the minister was ill, and stood erect with difficulty. Suddenly out of the naked savages rose the form of a strong warrior who had learned, through many acts of kindness and sacrifice, to love the black robed father. The warrior stole silently around and placed his shoulder against the back of the preacher, and as the preacher turned and looked inquiringly at him, not knowing what his movement meant, the Indian said to him, "If you love me lean hard". And so we say to you today, if you would know the strength of our hospitable greeting; if you would know how much we appreciate your coming, lean with confidence—lean hard upon the kindly hospitality which we offer.

Chairman Wells—Perhaps many who are here today from abroad know comparatively little about Michigan, but you have all doubtless heard of Michigan's Governor. His name and fame are not confined to the limits of his own State. Realizing how gratifying it would be to you all to see and hear Governor Pingree on this occasion and have him welcome you to Michigan in person, I greatly regret that I must announce that ill health prevents his being present. He has requested Doctor Gibbes to extend this welcome in his name, and I introduce to you Doctor Heneage Gibbes, Health Officer of the City of Detroit.

ADDRESS OF WELCOME.

BY HENEAGE GIBBES, M. D., HEALTH OFFICER OF DETROIT, MICHIGAN.

Ladies and Gentlemen:—I find myself in an unexpected position, having been requested by Governor Pingree last evening to represent him this morning and give an address of welcome to you, as a sudden indisposition prevents his attendance. I am very sorry His Excellency is not able to be present this morning. It is a disappointment to you. You will miss the many practical suggestions he would give you.

In welcoming you to the beautiful City of Detroit, I wish you to understand I do not make any invidious comparisons, as I am not familiar with many of the larger cities of the United States. Although I have lived in Michigan for ten years I am better acquainted with the larger cities of other countries. I am not a native-born citizen, but one by adoption.

Detroit is a healthy as well as a beautiful city to live in. Her sewerage system is almost perfect. Her garbage is disposed of satisfactorily. Her food supply is in quantity and quality all that can be desired. She is built on one of the most beautiful rivers I have ever seen. More tonnage passes daily than in any other place. Only one thing is needed to make this the most beautiful city in the world, that is a River-side park, which would enable the citizen to enjoy the beauties of the ever-flowing river and magnificent vessels passing up and down, with the beautiful Canadian shore in the distance. Her numerous parks scattered throughout and around the city and the beautiful Belle Isle, a veritable fairly land, and other Island parks within the easy reach of all, give the people of Detroit an opportunity for rest and recreation; giving that vital stamina which is nature's immunizer. This is expressed in the fact that only five houses are placarded for scarlet fever and there is no diphtheria in the city.

Turning from the City of Detroit to the State of Michigan, we have in our State everything that conduces to health and happiness here below. We have, within reach of the city, quail and grouse shooting, farther north as good deer shooting as found anywhere. The bass fishing is too well known to need describing. Farther north we have trout fishing which cannot be excelled anywhere. What can a man want better than to find in a day's journey a river which he can wade comfortably and catch during the day western trout, European brown trout, and the native grayling, and in addition to this the rainbow trout, one of the gamiest fish found in the world. They have been caught over seven pounds in weight. When a man has landed one of these rainbow trout with a fly, he has enjoyed one of the pleasantest experiences in the world, excelled only by the capture of a salmon in a Scotch river. So far as I myself am concerned I have only one more move to make, and that is to heaven.

With all due deference to the important work of the Convention, I would advise you if possible to take a portion of your time and run up to the "Flats" and do a little bass fishing and visit the places I have mentioned around the city. Then, when you leave I feel sure you will exonerate me from any charge of exaggeration.

New Sanitary problems are imposed upon us by the present war. I am not very familiar with the conditions in Cuba, but I have traveled extensively through all the other parts of the West Indies, Spanish Main, and the Brazils, and can easily understand the terrible fatality of yellow fever in those countries. Any one can hardly understand their ideas of sanitation without seeing the conditions.

Passing to Asia, India and China are well worthy of consideration; you can calculate very well the Sanitary condition of those countries by the number of victims dying annually from their ever-present plagues. This is the condition of these countries when I saw them, but that is some years ago, and I hope their ideas of Sanitation have advanced since that time.

Again extending to you a hearty welcome to our beautiful city, I trust your stay among us will be both pleasant and profitable.

Chairman Wells—To those engaged in public-health work no subject can have a deeper interest, or possess greater practical value than that of the Sanitary work of the last quarter of a century. The one whose occupation has been to observe, to chronicle and to criticise such labors is especially qualified to speak of the results of a quarter century of public health work. Dr. A. N. Bell, editor of the "Sanitarian", who has had long experience in recording the achievements of sanitary science, has prepared a paper upon this subject to be read at this meeting. He expected to read this paper to you in person, but, because of an unfortunate accident to Mrs. Bell, he has found it impossible to be present. By Doctor Bell's request, Doctor Henry B. Baker, Secretary of the State Board of Health, will read the paper.

A QUARTER-CENTURY OF SANITARY WORK, 1873-1898, TOGETHER WITH A SKETCH OF ITS PRELUDES.

BY A. N. BELL, M. D., EDITOR OF THE "SANITARIAN," BROOKLYN, N. Y.

MR. CHAIRMAN, LADIES AND GENTLEMEN:—If your appreciation of sanitary work during the quarter-century for which you have invited me to speak corresponds with my estimate of it, you will, I am confident, shortly perceive that the honor of your invitation has been most unworthily bestowed. For, while I concur with the general belief that of all the quarter-centuries since the first one of the Christian era, there has been greater progress in civilization in the present one than in any other, I venture to think, and shall endeavor to show, that of all the pursuits of knowledge that have contributed to human welfare, preventive medicine excels; and the more because it has been the chief means by which the art of medicine has been transformed into a science. Hence, while I have the courage to state this proposition, I shrink from the pretension of capability to adequately express a just appreciation of it.

Feebly as I may, I shall endeavor to show the culmination of this quarter-century of sanitary work, with which the State Board of Health of Michigan has been closely identified, by a brief summary of the preludes and forces which have contributed to it, and by particularizing some of its achievements.

The advent of cholera to England in 1831, despite the quarantine reguations which at that time obtained, gave Edwin Chadwick occasion to observe that whatever infectious property there might be in the disease, it was particularly prone to prevail under filthy conditions.

"In Poor Law administration," he said, "it appeared to me and my colleagues, on examination, that the great impending visitation would probably advance as to places chiefly on the lines and on local conditions on which ordinary epidemics proceed. I had been prepared by medical officers to take business out of its turn, because, from the state of the weather, they had a confident expectation that they would have some visitation of one of the ordinary epidemics to deal with. Asking one of them, the medical officer, what was the specific disease he apprehended, he stated that when he arose in the morning and found the atmosphere warm, moist, and stagnant, he always found that there would be an increase of some foul air disease—it might be typhoid, it might be scarlatina, it might be measles, it might be small-pox, but one species or another of eruptive disease he was sure to have in such weather in the low-lying and ill-drained districts. I asked a relieving officer of a large district—to test his knowledge of the habitat of such disease—whether, if I gave him some half-dozen cabs, he knew where, without previous knowledge, he could go and fill them with fever cases, and he said he could, just as a gamekeeper might go and get a bag of game—he said he certainly could; the cases might not be all of typhus, but fever cases of one sort or another; he knew where he could find them. It appeared that small-pox follows on much the same lines as typhus, and so does scarlatina, but with wider deviations as to classes of cases and condi-

tions of persons. On passing through a low district I observed, 'Surely this must be a fever nest,' when out came some children with the marks of recent small-pox upon them. I remember that I was once consulted by Dr. Lyon Playfair as to the readiest mode of making a sanitary inspection of an urban district, without the medical officer's or the Registrar-General's returns, which there was no time to get out. I advised him to go into one of the primary schools, and select a group of the most squalid children, get their addresses, and go there. He told me that he had acted on this suggestion; and that, in the first school, there were two boys with particularly blotched faces, and he had found that their habitations were at the confluence of some putrid sewage. On ill-paved, ill-cleansed and filthy streets the attacks are heavy, especially amongst children."

This citation is made for a two-fold purpose: its appropriateness as showing the receptive conditions of localities common to infectious diseases everywhere, and the mistaken contention of Mr. Chadwick and his colleagues, and their successors for thirty years or more, against local filth only as sufficient protection from foreign as well as domestic infectious diseases.

It was no new thing that dirt propagated disease, but why? had never been searched for. And the good results of the energy displayed by Mr. Chadwick and his co-workers appears for the time to have stifled scientific inquiry. In two reports—1849 and 1852, respectively—the General Board of Health, following the lead of Mr. Chadwick, "sought to disparage the contagionistic medical opinions which were represented in systems of quarantine and to substitute for them a doctrine that epidemic diseases have their primary and essential condition in an epidemic atmosphere, which (irrespective of traffic) may exist over thousands of square miles, and yet affect only particular (unwholesomely kept) localities. Contending on the strength of that hypothesis that quarantine could not give any but a false security for the purpose it pretended to accomplish, and adducing illustrations of the futility and oppressiveness of quarantine as commonly administered, the Board proposed, as practical conclusion, that the country should entirely set aside the existing quarantine establishments, and should rely exclusively on the protection it could derive from a system of local sanitary improvements."*

It is especially noteworthy with reference to this pronouncement that the General Board of Health did not then have, and had not had hitherto, a medical man among its members or officers. And that it did not have a medical member until by virtue of its charge of the "Interment Act," in 1850.

Dr. Rumsey, referring to this subject some years later in the preface of his *Essays on State Medicine*, speaks of it in the following terms: "Who would have thought that in the last decade of advancing civilization, and in a nation boasting of its intellectual and material resources, of its administrative energy and efficiency, the whimsical experiment should have been actually tried of appointing three non-medical authorities—two Lords and a Barrister—to preserve the health of the living; and then, after a year or so of doubtful success, calling in a physician to bury the dead?"†

*English Sanitary Institutions. John Simon, p. 219.
†Op. cit., p. 211.

Nevertheless the public acts, 1848-1858, authorizing the war on filth, and prosecuted as it was by Mr. Chadwick and his co-workers and successors, secured a world-wide reputation for the life-saving effects of cleanliness.

It was at an early period under its auspices that, in 1839, in order that the Registrar-General might be enabled to turn to scientific use the vast quantities of detailed information flowing into his hands, and especially the facts medically certified to him as to the causes of registered deaths, William Farr, at the instance of Mr. Chadwick, had been appointed Compiler of Abstracts in his office. "Eminently," says Sir John Simon, "he was the man to bring into statistical relief, and to make intelligible and instructive to the common mind, whatever broad lessons were latent in the life and death ledgers of the great counting-house. Eminently, too, not a man to forget the practical human interest of such mathematics."* Mr. Farr's first annual report was made in 1841. He continued in office until 1879, and to him more than to any one else the nation is indebted for creating the demand for sanitary work: *The Registration of Vital Statistics.*

The particularly important events of this decennium were Dr. Farr's statistical reports of the cholera invasion and dissemination, and Dr. John Snow's first utterance, in 1849, of his theory as to the propagation of cholera by means of the intestinal discharges of the sick.

The first Medical Officers of Health in England were in virtue of acts procured by the Town Councils, of Liverpool, in 1847, when Dr. William Henry Duncan, the earliest of the medical profession to hold any such office, was appointed Medical Officer of Health of that city; and, in 1848, when the corporation of the city of London obtained like powers and appointed Dr. John Simon Medical Health Officer of that city. By him appointments of local medical officerships were initiated and the acquirement of exact knowledge as to the local distribution of diseases undertaken. In 1855 Dr. Simon's office was made the Central Medical Officership. At that time there were no statutory functions of a medical kind, except as to special occasions when cholera or some other such danger might require the Disease-Prevention Act to be in force. The laws were incongruous and sanitary work unsystematic. Sundry investigations followed and many important facts were elicited contributing to the consolidation and comprehensive acts of 1871-72, changing the status of the Central authority and giving it full general powers of control and direction over all local health authorities, so that it should be able to give the public connected information on the matters in question, and making it obligatory on every local authority to have at least one Officer of Health, being a legally qualified medical practitioner, or possessing such other qualifications in medical science as shall be declared by the Central authority to be satisfactory.†

It is quite safe to say that previous to 1871, when the powers of the General Board of Health were enlarged, there had been no sanitary organization in England that would compare favorably with the Metropolitan Board of Health of New York, organized in 1866.

Moreover, it was during this same interval, while quarantine was suspended in England, that, in 1857-1860, the health authorities and commercial bodies of this country formulated quarantine regulations that have

*Op. cit., p. 214.
†Op. cit., pp. 329, 346.

constituted the basis of our quarantine laws since, and with which recent port sanitary regulations of England agree. Among the important incidents of the period, in England, was the introduction of yellow fever at Swansea, in 1865, by the return trip of the bark *Hecla*, a Swansea vessel, that had left Cuba July 26 with a cargo of copper and arrived at Swansea September 2d. She had a clean bill of health and was not subjected to a critical examination. Within an hour of her arrival two passengers landed with their baggage and several of the crew had left and distributed themselves about the town, and visitors were admitted on board without restraint. Within three hours from the time of arrival the hatches were removed and the discharge of the cargo began. Three of the men who were permitted to land were sick, two of whom—the captain said—were convalescent from fever, and the other one had the dropsy. The one who had the "dropsy" died the next day in the town with unequivocal signs of yellow fever. An uncertain number of cases occurred among the people of the town, fifteen of which were fatal. But all of the cases reported upon were traced to communication with the vessel.

Whether this misadventure had anything to do with the revival of port regulations for the prevention of the introduction of infectious diseases which had been superseded by the Chadwick regime does not appear. But the Act of 1872, under the head of Port Sanitation, provides:

Hospital accommodations for infectious diseases; means of transporting cases to hospital and officers from ship to ship; apparatus for disinfection, together with needful provision against the landing of rags or other things liable to infection from infected ports. And the Medical Officer of Health is required to take such steps as may appear to him to be necessary for the prevention of the spread of infection.

But still more explicitly with regard to cholera, yellow fever and plague, in virtue of the public health acts of 1875 and 1896, the port sanitary regulations, by order of the Local Government Board, are, excepting that in some respects they are more rigid, quite in line with the quarantine regulations of the United States.

They are in substance as follows: Every port sanitary authority, and every other sanitary authority within whose district persons are likely to be landed from ships coming from foreign ports, shall, with the approval of the chief officer of customs of the port, fix some place where any ship may be moored or anchored, and such ship shall remain there until the requirements of this order have been duly fulfilled; and shall make provision for the reception of patients and persons suffering from cholera, yellow fever and plague; and no person so removed shall leave such hospital or place until the Medical Officer of Health shall have certified that such person is free from said disease.

If any person so certified to be suffering from cholera, yellow fever or plague cannot be removed, the ship shall remain subject, for the purposes of this order, to the control of the Medical Officer of Health; and such person shall not be removed from or leave the ship, except with the consent in writing of the Medical Officer of Health.

Any person certified by the Medical Officer of Health to be suffering from any illness which such officer suspects may prove to be cholera, yellow fever or plague, may either be detained on board ship for any

period not exceeding two days, or be taken to some hospital or other suitable place appointed for that purpose by the sanitary authority, and detained there for a like period, in order that it may be ascertained whether the illness is or is not cholera, yellow fever or plague. The Medical Officer of Health, if he have reason to suspect any ship coming or being within the jurisdiction or district of the sanitary authority, whether examined by officer of customs or not, is infected, shall, or if he have reason to suspect that the ship has come from an infected place, may visit and examine such ship for the purpose of ascertaining whether such ship is infected; and may make the like visit and examination in the case of any ship coming or being within the jurisdiction of the sanitary authority which has come from an infected place. * * * And here follow directions for disposal of the dead from those diseases in such manner as to be without danger to any one; the disinfection or destruction of merchandise and clothing, and the disinfection of the vessel.

The master of every ship infected with cholera, yellow fever or plague shall, when within three miles of the coast of any part of England or Wales, cause to be hoisted at the masthead, or where best seen, a large flag of yellow and black, borne quarterly, and shall keep the same displayed during the whole of the time between sunrise and sunset, and no person (other than an officer of the customs or a person acting in the execution of this order) shall leave such ship until after such visit.

Moreover, it is made the duty of Medical Officers of Health, in respect of the port sanitary districts for which they are appointed, to inform themselves as far as practicable respecting all influences affecting or threatening to affect injuriously the health of crews and other persons on shipboard within their respective districts. To inquire into and ascertain by such means as are at their disposal the causes, origin and distribution of diseases in the ships and other vessels within their districts, and ascertain to what extent the same have depended on conditions capable of removal or mitigation.

By inspection of the shipping in their districts, respectively, to keep themselves informed of the conditions injurious to health existing therein, and be prepared to give advice on all sanitary points involved to the port sanitary authority.

Regulations requiring notification of infectious diseases, isolation of persons affected with such diseases, closing of schools for the prevention of their spread, infectious-disease hospitals, under recent laws, excel ours in strictness. Besides, special regulations are provided for, "for the treatment of cholera, or any other epidemic, endemic, or infectious diseases, and for the prevention of the spread of such diseases as well on the seas, rivers and waters of the United Kingdom, and on the high seas within three miles of the coasts thereof, as on land, and may declare by what sanitary authorities such regulations shall be enforced and executed."

The most important of the investigations undertaken by the Local Government Board, soon after Dr. Simon became the Chief Medical Officer, in 1871, was the *water supply*.

The results of that investigation, pursued for several years under various commissions and committees, are comprehended in a report upon "The Water Supply of Cities," by Prof. C. F. Chandler, just twenty-five years ago, at the meeting of the American Public Health Association in

New York, of which the following is an abstract—on the testimony of a large number of the most celebrated physicians and chemists: "The commission declared themselves satisfied with both the quantity and quality of the water supplied by the Thames." But Dr. Frankland, Professor of Chemistry at the Royal Institution, dissented, and made some criticisms. To these Dr. H. Letheby, the Medical Officer of Health for the city of London, addressed the committee in reply: "I have to state that I cannot agree with Dr. Frankland that the water of the Thames, after receiving defecated sewage water, is unfit for domestic use; for, after a large practical acquaintance with the subject as it is observed in the principal streams and rivers of England, I have arrived at a very decided conclusion that sewage, when it is mixed with twenty times its volume of running water and has flowed a distance of ten or twelve miles, is absolutely destroyed; the agents of destruction being infusorial animals, aquatic plants and fish and chemical oxidization."

At a subsequent investigation, on the evidence of Dr. Parkes, Professor of Military Hygiene at Netley; Sir Benjamin Brodie; Dr. Odling, Professor of Chemistry at the Royal Institute; Dr. Miller, Professor of Chemistry at Kings College; Dr. Letheby again, and others, the Royal Commission again reported at great length, endorsed the previous reports, and concluded that for these reasons—the evidence as given—"We believe that the organic contamination of the Thames is much less than is commonly imagined; still it would be sufficient to do great mischief, were it not for a most beneficial provision of nature for effecting spontaneously the purification of the streams."

This report, made in 1869, appears to have been abundantly satisfactory to Prof. Chandler, for he adds: "It has been before the British public in an accessible form, in all its details, nearly five years, and its conclusions have been generally accepted."

He gives as his reason for selecting the Thames as the chief basis of comparison with American water supplies, because it had been more carefully studied than any other source of city supply and because it may be considered an extreme case. But he also cites the sources of supply to a number of other foreign cities whose death rates from cholera and typhoid fever had been notoriously large; and "that there is generally no fear on the part of engineers and those having charge of water supplies in American cities is fully shown by the fact that many of our largest cities take water from rivers. * * * Jersey City, from the Passaic; Philadelphia, from the Schuylkill; Washington, from the Potomac; Cincinnati and Louisville, from the Ohio," and some other deadly examples which still obtain.

The report then proceeds to give the chemical analyses of a number of such river supplies, and concludes: * * * "For the supply of cities, lakes or rivers must be selected, and although rivers are the great natural sewers, and receive the drainage of towns and cities, the natural process of purification in most cases destroys the offensive bodies derived from sewage and renders them harmless. In very rare cases will organic matters be derived from swamps and peaty deposits, and except that these bodies may sometimes discolor the water, there is no sanitary objection to them."*

My purpose in citing this report of Prof. Chandler at such length is to show the concensus of medical opinion and the sum of chemical

*Public Health. Vol. I, p. 533-563.

knowledge of what was considered healthful drinking water at the beginning of the era of our special consideration, and because this report was a sustaining force of one of the chief obstacles against which sanitarians have had to contend. There were sanitarians at that time fully alive to the dangers of water pollution with sewage, and especially with reference to typhoid fever, as well as cholera, as indicated by the results, but biological researches had not yet sufficiently advanced to verify those results. Indeed, it appears that what Lord Bacon said of the medicine of his day, that it stood for judgment on quite different merits than did other learned pursuits, was scarcely less true at the beginning of this quarter-century than at the time of his utterance.

"Other arts and sciences," he said, "are judged of by the power and ability exhibited in the conduct of them by their professors, and not by success or events. The lawyer is judged by the skill of his pleading, not by the issue of the trial; the pilot by his skill in directing the course of his ship, not by the fortune of the voyage. But the physician can form no particular act by which his ability can be directly demonstrated, and therefore he is principally judged by the result, which is very unjust. For who shall decide, if a patient die or recover, whether the good or the evil is brought about by art or by accident? Whence imposture is frequently extolled and virtue decried. Nay, the weakness and credulity of men is such that they often prefer a mountebank or a cunning woman to a learned physician. So the accidents made Æsculapius and Circe brother and sister and both children of Apollo. Hence," he adds, "physicians say to themselves, in the words of Solomon: 'If it befall to me as befalleth fools, why should I labor to become more wise?' And therefore one cannot wonder that they commonly study some other art or science more than their profession, because they find the mediocrity and excellency in their own art makes no difference in profit or reputation, for man's impatience of diseases, the solicitude of friends, the sweetness of life, and the inducements of hope, make them depend upon physicians with all their defects."

With a few exceptions, this estimate of the art of medicine by Lord Bacon obtained until the eve of the quarter-century of our particular consideration. Omitting the rest, one exception is pre-eminently worthy of mention—Jenner's discovery of vaccination—for never was discovery more thoroughly demonstrated on a scientific basis than this, based on a considerable period of observation and repeated experiments before it was announced. It was a contribution *toward*, though not to the science of medicine. It stood alone for half a century. Though Jenner, in his lifetime, in answer to the question whether vaccination might not be a means of controlling other diseases besides small-pox, said:

"The vaccine disease, in my opinion, is not a prevention of the small-pox, but the small-pox itself; that is, the horrible form under which it appears in its contagious state is (as I conceive) a malignant variety. Now, if it should ever be discovered that the plague is a variety of some milder disease, generated in a way that may even elude our researches, and the source should be discovered whence it sprang, this may be applied to a great and grand purpose. The phenomena of the cow-pox open many paths for special action, every one of which I hope may be explored."

Yet there was no attempt made to attenuate other diseases besides

small-pox, as suggested by Jenner, until it was brought about by Pasteur's researches into the causes of certain forms of disease in French vineyards. There were earlier discoveries of bacteria by Leeuwenhœck and others, in almost every kind of organic matter in process of decomposition, but the part they played in disease was not even hinted at.

In 1840 Henle announced that the cause of miasmatic infective contagious diseases must be looked for in similar minute living organisms. He was unable to offer any satisfactory experimental proof of his theory. But his argument in favor of it created a profound impression, and from that time forward greatly increased attention was given by medical and other microscopists to all infective diseases. In 1843 Mitscherlich pointed out that as yeasts gave rise to fermentation, so vibrios in like manner must be the cause of putrefaction; and Helmholtz showed that by the use of a membrane it was possible to separate from a putrefying liquid a fluid which, under suitable conditions, would remain sterile without the application of heat or chemicals. In 1849 Pollender discovered microbes in the blood of the spleens of cows that had died of splenic fever; this discovery recalled attention to what Henle had suggested, that these organisms were in some way etiologically connected with the outbreak of anthrax. Six years later he gave a more detailed description of his discovery, but meanwhile Davaine and Rayer described bacteria taken from the blood of animals affected with splenic fever.

In 1857 Pasteur described a new fermenting organism which he showed had the power of forming lactic acid from sugar. For this, however, the presence of nitrogenous matter was essential, not because the elements were required for the composition of the lactic acid, but because they were necessary for the nutrition of the organism which produces it, thus throwing a new light upon the relation between cause and effect in fermentation. In 1862 Pasteur published his paper on organized corpuscles existing in the atmosphere, and by a series of experiments showed that unless organisms were introduced into the organic fluids from without, by some means or other, no putrefaction could take place —that is, until some organisms were present which could grow and multiply in the fluid, no evidence of organic life would make its appearance.

In this year, too, Traube showed that ammoniacal fermentation of the urine in the bladder would not take place if the access of vibrios from without were prevented; and Pasteur, after insisting upon the same fact, indicated that this fermentation might be prevented by the presence of boracic acid, and he proposed that in cases of operations on the bladder the parts should be kept irrigated as far as possible with a three or four per cent solution of that substance.

This lucid paper of Pasteur on "Organized Corpuscles in the Air" was the prelude to Professor Lister's experiments on the antiseptic treatment of wounds, first undertaken three years after Pasteur's paper. His experiments at the first were crude and difficult of application, but with a persistence commensurate with his nobleness of purpose, after two years perseverance he had rendered them so facile and so successful in his hands that, in 1867, he insisted upon the importance of excluding special bacterial organisms from wounds.

It is no disparagement of the brilliancy of the results of following Professor Lister's practice in the application of knowledge of disease

germs and germicides, drawn from the store of facts developed by sanitary work, to surgical procedure, to invite attention to the even more brilliant results that have followed the like recourse to Professor Lister's, by medical practitioners. The brilliancy of the surgical results is more apparent because it is more easily demonstrated than the results of medical practice.

In 1872 Bollinger demonstrated the presence of spores in the bacillus anthracis. He also showed that if blood from a cow affected with splenic fever were kept for some time, the rods disappeared, but the blood still retained its virulence. This virulence he attributed to the presence of spores, which, though remaining inactive under conditions unfavorable to the existence of the anthrax bacillus, still retained their vitality; and by the recurrence of conditions favorable to their development they assumed the form of the bacillus and were then capable of setting up the disease. He pointed out the important bearing of this retained vitality of germ spores on the question of infection of the soil; and, by indicating that the so-called epidemic diseases were due to the fact that the conditions were favorable or otherwise—perhaps intermittently—for the growth and development of anthrax organisms, he not only discovered the etiology of those diseases, but, by pointing out the conditions under which the vitality of their germs were maintained, he displayed the feasibility of preventing or stamping out such diseases by sanitary work.

Closely related in substance to Bollinger's discovery were Dr. George M. Sternberg's observations on the soil in New Orleans, as reported by him to the National Board of Health in 1881. "The fact observed by myself," he says, "that during the summer months the mud in the gutters of New Orleans possesses an extraordinary degree of virulence, shows that pathogenic varieties of bacteria are not alone bred in the bodies of living animals. The more I study this subject the more probable it seems to me that in this direction lies the explanation of many problems which have puzzled the epidemiologists, and that the sanitarians are right in fighting against filth as a prime factor in the production of epidemics—a factor of which the role is easily understood, if this view is correct. The presence of septic organisms possessing different degrees of virulence, depending upon the abundance and kind of papulum furnished them, and upon meteorological conditions more or less favorable, proves, in my opinion, the epidemic constitution of the atmosphere, which wise men were wont to speak of a few years ago as a cloak for ignorance. It must be remembered that the gutter mud of today, with its deadly septic organisms, is the dust of tomorrow, which in respiration is deposited upon the mucous membrane of the respiratory passages of those who breathe the air loaded with it."

Moreover, foremost in sanitary work for the time being, in the quarter-century of our contention, was that as a whole, which the paragraph just above quoted brings to mind, the work of the National Board of Health during the period of its active existence, 1879-81. How earnestly and successfully it battled with and stamped out the yellow fever in Memphis and New Orleans is popular history. But this was but a mere item of its work. It promptly revised the situation and appointments of the quarantines of the Southern Atlantic and Gulf Coast harbors; established refuge stations for infected vessels; instituted sanitary inspection of vessels, railway coaches and persons at infected ports and places of

departure; established a sanitary police of the lower Mississippi in time of yellow fever at any port or landing thereon; required thorough cleansing, disinfection and aeration of all houses, river vessels and boats, in which there had been cases of yellow fever. To notice in detail the investigations made by Drs. Chaillé and Sternberg on fevers; Drs. Wood and Formand on diphtheria; Professors Remsen and Smyth on the dangers of carbonic oxide and soil gases; Professors Mallet, Martin and Pumpelly, on the organic matter in potable water; Col. Waring and Mr. Bowditch's report on sewerage and drainage in the United States; Mr. Rudolph Hering's report upon sewerage works in Europe, and many other scientific investigations conducted under the auspices of the Board, and their practical results, would require much more space than this occasion affords.

In 1875 Klebs first described the bacillus of typhoid fever, and again, with Eberth, more accurately, in 1880; in 1884 Koch demonstrated the bacillus of cholera, and Loeffler that of diphtheria; but it is needless to pursue this category, literature with which we are all familiar is filled with it. Equally important to our contention is the relation of these discoveries to measures for their prevention or destruction. Hitherto the use of disinfectants had been an art only and empyrical. Certainty of their utility awaited their application to disease germs as a test of their efficiency, and thus disinfection has become a scientific procedure. Steam had been used to a limited extent and had won the confidence of all who used it by its recognized result as an efficient disinfectant, for many years, but it was not until 1884, when Dr. Sternberg reported that by actual experiment it was fatal to all of the pathogenic and non-pathogenic organisms tested, in the absence of spores (with the single exception of sarcina lutea), at a temperature of 143.6°, which placed its use on a scientific basis, that it has since that time been generally accepted. Nevertheless, the first ship disinfection undertaken on a strictly scientific basis was with mercuric bichloride, in virtue of its known germicidal properties, by Dr. Joseph Holt in the same year that Dr. Sternberg declared the efficiency of steam. Two years afterward, however, Dr. Holt "became fully convinced of the entire sufficiency of the moist high temperature, as in itself a potential agent of the most decisive kind."* And the use of steam has since become one of the most efficient agents in sanitary work in the destruction of disease germs.

Antitoxins were the outcome of sanitary work by Salmon and Smith in 1886, who showed that the products of active or virulent bacilli were capable of inducing very severe symptoms or septic poisoning, so the products of attenuated bacilli, if injected into an animal, confers a degree of protection against the actions of virulent bacilli almost, if not quite, as great as that obtained when the attenuated bacilli are themselves injected. This discovery, together with Sewall's observations on the immunity produced by gradually increasing doses of cobra poison, and the observations of Von Fodor and Nuttall on the bacterial action of blood and blood serum, opened up the way for the production of antitoxin serum by Behring, Kitasato, Ogata and others in 1889-90, and the antitoxin treatment of diphtheria and tetanus, which began in 1891 and has been the means of prolonging many thousands of lives.

Efforts for the protection and purification of water supplies seem to have awaited conditions somewhat analogous to the use of disinfectants

*Sanitarian Vol. XVII, p. 331.

—the discovery of disease germs in polluted water. At any rate, it is only since the discoveries of Eberth and Koch that chemists and engineers have become convinced that sewage is unwholesome, no matter how much diluted.

The benefit of purification methods is aptly shown by the reduction of the death rates from typhoid fever.

Death rates from typhoid fever per 100,000 population for seven years ending December, 1896:

Cities using lake water—Chicago, 71; Milwaukee, 29; Detroit, 30; Cleveland, 46; Buffalo, 34. Average, 42.

Cities using river water—Pittsburg, 84; Philadelphia, 45; Cincinnati, 49; Louisville, 74; St. Louis, 39. Average, 58.

Cities using filtered water—London, 14.4; Berlin, 7.1; Rotterdam, 5.7; Hamburg (filters put in service May, 1893), 9.7. Average, 9.1.

But there are no more striking examples than those of Lawrence and Lowell, Massachusetts:

"The city of Lawrence, with a population of 55,000, draws its water supply from the Merrimac River, after it has received the sewage from Lowell, nine miles above. The city of Lowell, with a population of 85,700, draws its water supply partly from the Merrimac River and partly from a system of driven wells. Lawrence, however, has filtered its water since September, 1893, while Lowell uses such water as is drawn from the river in its natural state.

"The typhoid fever death rates per 100,000 of population living, for these two cities since 1890, have been:

Year.	1890	1891	1892	1893	1894	1895	1896
Lowell	158	98	90	61	55	39	42
Lawrence	123	115	102	93	48	31	15

"The average death rates for the years 1890 to 1892, inclusive, before filtered water was used in Lawrence, were, for Lowell, 115, and for Lawrence, 113, or quite the same; while for the three years, 1894 to 1896, inclusive, during which time filtered water was used in Lawrence, the average rates were, for Lowell, 45, and for Lawrence, 31. The percentage of reduction in the rates for Lowell was 40, and for Lawrence over 72, leaving a net reduction of 32 per cent to be credited to the filtered water of the latter city."*

Unfortunately, the protection of our water supplies, excepting in Massachusetts, is not under the direction of the sanitary authorities. The excellent results in this exceptional case, as just cited, should not fail of influence on the legislative authorities to confer like power on all of the State Boards of Health.

Allied to the protection of the water supplies, however, is the protection of milk and other food supplies, which has been a signal illustration of sanitary work, State and local, so extensive and so generally acknowledged as to require no details.

Of the sanitary work in the public service, Army, Navy and Marine Hospital Services, now in such prominent evidence, the co-operation entered upon at the beginning of the war is worthy of the highest praise, and unqualified confidence in the joint effort to prevent the spread of yellow fever, even though it may, from time to time, under the extra-

*Public Water Supplies. Hill, p. 36.

ordinary circumstances of the occasion, find entrance. The exceptional promptitude with which the disease was stamped out after its discovery at McHenry, Miss., May 20, is an encouraging example of energetic work.

And what may now be said of the crusade that has but just now begun, as it were, against tuberculosis, omitting any attempts to discuss that phase of it which has been in progress for several years in the destruction of cattle—further than to rivet attention, if possible, to the liability of children to *intestinal* tuberculosis, and since children are the great milk consumers—to insist upon this fact as a sufficient justification of the destruction of tuberculous cows, and for the most rigid supervision of the milk supply by the sanitary authorities.

Every sanitarian readily recalls to mind the discovery of the fostering influence of tuberculosis by a damp soil, in 1862, by our always-to-be-remembered pioneer in sanitary work, the late Henry I. Bowditch, and recognizes the immense benefit of that discovery in the promotion of soil drainage. But our present reference is more particularly to Koch's discovery of the tubercle bacillus fifteen years ago. And since the recognition of the communicability of the disease by the inhalation of the bacilli from the dried dust of the sputum of consumptives, the question of *how to prevent* this danger with the least possible inconvenience to the afflicted is one of the most important problems of practical sanitation. That there are various means adaptable to the different conditions of exposure and the proper care of consumptives, subject to sanitary supervision, every sanitarian knows. And the salutary results are proven by the diminishing death rate from consumption wherever it has been imposed. Moreover, the restrictive measures of sanitary authorities in this regard have been an educational force among the people at large. And no persons have become more keenly alive to the danger of tuberculosis sputum than consumptives themselves, who would be the last to afflict in like manner those who are dear to them or other persons. While, therefore, their sensitiveness in this regard should always be respected, the day has gone by—even with them—when such sensitiveness should be an obstacle to the protection of human life. Consumption is no longer regarded as a family disease—much less a community disease—but a personal one: a disease that is ordinarily contracted by inhaling the dust of dried sputum, and above all by persons whose resisting powers are below par from any cause, though no person, however well, can be considered absolutely exempt from the danger of such exposure.

The *tendency* to consumption is constitutional weakness from any cause, no more likely to be "inherited" from consumptive parents than from dyspeptic parents, and not as likely from either as from the stifling air and physical restraints of some schools. Besides, the tendency to disease from these sources extends to other diseases as well as to consumption. Disease germs are beyond question the chief antagonizing force to human existence upon the earth. They belong to a great family of vegetable organisms whose office in the rôle of living things is, in general, beneficent, but, as in the higher orders of vegetable organisms, some are poisonous, and these are the "pathogenic microbes"—disease germs. Of their life-history there is nothing known beyond their present aspect. No evolutionist has yet instituted inquiry into their primitive form—if they were ever of any other than as now observed—or ven-

tured to anticipate their development in the future. Nor, indeed, has there ever been described any division of their bodies into special organs or any function beyond their self-multiplication by "fission"; that is, by division of each unit into two, and so on, ad infinitum, resulting by geometrical progression in such an enormous increase of numbers in a very short space of time—under favorable circumstances—as to defy the power of imagination to comprehend.

When we consider that an impure atmosphere is one of the most favorable conditions for their propagation, and reflect upon the facility of their reproduction and marvelous distribution, we may well wonder how is it possible to escape them. Indeed, it is impossible. But from the scientific basis on which Preventive Medicine rests, we can fight them, and though we may not be able to wholly subdue and conquer them, we can so cultivate our powers of resistance to them as to measurably defy them.

Stamina is an educational force of primary importance to both body and mind. All understand that a pure atmosphere is essential to the maintenance of health. But, owing to the wonderful facility which the human body possesses of accommodating itself to circumstances, it frequently happens that school assemblies breathe a most unwholesome atmosphere day after day, or perhaps for weeks, without apparently suffering from it, while one after another of the pupils is continually dropping out—overtaken by some epidemic disease. English statistics, which are more complete than any others accessible to us, show that the death rate of elementary school teachers is 20 per 1,000—more than double that of soldiers on home service and four times as great as that of the police or of seamen. It is from five to six times greater than that of criminals who have no specific disease among them in prison. And of school children, the best results obtained are from half-time schools—schools in which but half the time is devoted to mental study and the other half to physical exercise. Indeed, education without sanitation must be, *ex necessitate rei*, always unsatisfactory.

Sanitary work has been not only eminently successful in the promotion of school hygiene in the United States during the era of our consideration, so evident that he who runs may read, but it has concerned itself with eminent success in the promotion of medical education.

With but one single exception, that of North Carolina, all of our State laws for the prevention of quackery, commonly designated Medical Practice Acts, are chiefly, if not wholly, due to the influence of our State Boards of Health. With special reference to the leading spirit in the promotion of the Medical Practice Acts, the late John H. Rauch, we know of no better description of the relation of such Acts to sanitary work than the summary prefacing the Sixth (1883) Annual Report of the Illinois State Board of Health:

"Boards of Health are created and maintained for the conservation of the interests of health and life. Ordinarily their functions are limited to dealing with sanitary questions; with the removal of the causes of preventable disease and premature death. This Board, however, is also charged with the execution of the Act to regulate the practice of medicine in the State; and thus the medical profession, one of the most important agencies which is concerned with the interests of health and life, is brought within the scope of sanitary legislation. To improve the status of the individual practitioner, and to develop a well-trained and thor-

oughly educated medical profession, must result in increasing the value of this force in sanitary science and public hygiene; a force, which in the nature of things must always exist so long as there are physicians and patients; and the character and influence of which must always hold a direct relation to the tone, attainments, and the competency of those by whom it is exerted."

In an address Dr. Rauch delivered as Chairman of the Section of State Medicine, at the session of the American Medical Association in 1886, he submitted certain propositions which he considered germane to needful action of that body in the promotion of the highest attainable standard of medical education, and in order to give practical effect to them he specifically suggested:

"That the American Medical Association should put itself upon record at that session as recommending the extension of the period of study to four years, and of attendance upon lectures to three full terms, with ample hospital practice and clinical instruction, as the requirements for graduation in medicine."

The Association did not so put itself upon record until six years afterward. But Dr. Rauch ceased not to so urge to the day of his death. At the recent meeting of the Association in Denver, Dr. Rauch's suggestion was unanimously adopted by special resolutions, as hereto appended.*

Well did Tyndall observe, as a physicist twenty-three years ago: "If recent theories on the propagation of disease by germs were proved to be correct, and if the laws which govern the propagation or destruction of those germs were known, the art of the physician would be raised from dependence on empirical observation into the position of an exact science. * * * For never before," he said, "was medicine manned and officered as it is now. * * * On the old Baconian lines of observation and experiment the work is carried on. The inter-communication of scientific thought plays here a most important part. * * * While physiologists and physicians in England and elsewhere were drawing copiously from the store of facts furnished by the researches of Pasteur, that admirable investigator long kept himself clear of physiology and medicine. * * * The union of scientific minds is, or ought to be, organic. They are parts of the same body, in which every member, under penalty of atrophy and decay, must discharge its due share of duty imposed upon the whole. * * * In observational medicine one fine piece of work may be here referred to—the masterly inquiry of Dr. Thorne into the outbreak of typhoid fever at Caterham and Redhill. Hundreds were smitten by this epidemic and many died. The qualities of mind illustrated in Dr. Thorne's inquiry match those displayed by

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*AMERICAN MEDICAL ASSOCIATION.

Philadelphia, June 30, 1898.

Dear Sir: At the recent meeting of this Association the following was unanimously adopted:

Whereas, The American Medical Association did, at Detroit in 1892, unanimously resolve to demand of all the medical colleges of the United States the adoption and observance of a standard of requirements of all candidates for the degree of doctor of medicine which should in no manner fall below the minimum standard of the Association of American Medical Colleges; and

Whereas, This demand was sent officially by the Permanent Secretary to the deans of every medical college in the United States, now, therefore, the American Medical Association gives notice that hereafter no professor or other teacher in, nor graduate of, any medical college in the United States which shall, after January 1, 1899, confer the degree of doctor of medicine or receive such degree on any conditions below the published standard of the Association of American Medical Colleges, be allowed to register as either delegate or permanent member of this Association.

Resolved, That the Permanent Secretary shall within thirty days after this meeting send a certified copy of these resolutions to the dean of each medical college in the United States and to each medical journal in the United States.

WILLIAM B. ATKINSON,
Permanent Secretary.

William Budd in his memorable investigation of a similar outbreak in Devonshire. Dr. Budd's process was centrifugal—tracing from a single case in the village of North Lawton the ravages of the fever far and wide. Dr. Thorne's process was centripetal—tracing the epidemic backward from the multitude of cases first presented to the single individual whose infected excreta, poured into the well at Caterham, were the cause of all.

Finally, my friends, the good time a-coming, announced by Tyndall twenty years ago, has arrived! The sanitary work of the quarter-century of our contention in correlation with the facts it has evoked in conjunction with collateral delvers into the foul soil it has cleansed, into the impure waters it has clarified, into the marshes it has drained, the air that it has screened from malignant organisms are the notes of its triumphant song in praise of sanitary methods.

Chairman Wells—"Public Health Work in Michigan"—The gentleman who is to address you on this subject is a native of Michigan, and one of the products of our State to whom we can point with pride. Though he left Michigan before its systematic public-health work had fairly begun, yet he has watched its development with interest. Our loss was Chicago's gain, and the work of Doctor Reynolds during the exposition and the terrible outbreak of small-pox which followed it is known to most if not all of you. Though interrupted for a time in his efforts to perfect the sanitary systems of a great city, he is now rapidly bringing to bear upon the problems which this work presents a degree of knowledge and executive ability which are rapidly placing Chicago in the front rank of cities in our own land whose inhabitants are protected in their lives and health by every means which modern science and skill can dictate. I introduce to you Doctor Arthur R. Reynolds, Health Commissioner of Chicago.

PUBLIC-HEALTH WORK IN MICHIGAN.

BY ARTHUR R. REYNOLDS, M. D., HEALTH COMMISSIONER OF CHICAGO.

When I first received an invitation to address this assembly my impulse was to decline, knowing full well that I had not time at my command in which to prepare anything adequate for such a noteworthy occasion. I finally yielded, however, to an urgent repetition of the invitation, largely because I recalled that it was in this State, at the village of Orion, just forty miles from Detroit, twenty-four years ago, that I began my medical career. That was in the office of an older brother, then of Orion, later of this city, but now of tender memory.

It was then I received my first lesson in preventive medicine through pamphlets of instructions on the limitation of the spread of the contagious diseases, the disinfection of premises, etc., prepared and sent me by Dr. Henry B. Baker, then as now the faithful and efficient Secretary of the Michigan State Board of Health.

In the few desultory remarks which I shall offer I need not refer to the origin of the State Board of Health of Michigan, for this Convention is held in commemoration of the fact that it was established just twenty-five years ago.

Looking back to that date, I think it will be admitted that the sponsors of the Board builded more wisely than they knew in selecting its natal year. Sanitary science was then in its swaddling clothes; an infant—lusty, it is true, and full of the promise of potencies then undreamed of; but still an infant.

The germ-theory of disease was yet struggling for recognition, and there were, probably, in July, 1873, when the Michigan State Board of Health Act took effect, more believers in the theory of spontaneous generation than in the doctrine of a living contagion as the cause of disease.

The culture-tube, the bacteriologic microscope, the instruments of precision familiar to the present day, were then known only to a few isolated students.

Disinfection, now an exact science—its practice subject to the control tests of the laboratory—was then a rule-o'-thumb art, whose best results were obtained by disengaging a smell so foul and irrespirable that it compelled doors and windows to be opened for the access of nature's potent disinfectant—fresh air.

The modes of the spread of the contagia of the communicable diseases were only vaguely guessed at—indeed, some of the most prevalent and deadly of the preventable diseases, tuberculosis, for example, were not even recognized as communicable, still less were their causes known or their ways and means of propagation understood; while induced immunity against the infective diseases of the human family was limited to the empiric practice of vaccination.

And so in almost every branch of what may now justly claim to be an exact science there was incertitude, vagueness, speculation and primeval ignorance.

It was in this field that the Michigan State Board of Health entered twenty-five years ago and a record of its labors and achievements during the intervening period would be a history of the development of sanitary science to its present well-nigh perfect proportions.

I will not here attempt even to summarize these labors and achievements. Their story is well and fully set forth in the pages of Mr. MacClure's volume, "A Quarter of a Century of Public-Health Work in Michigan", to which you all have access.

What God hath wrought through this Board is therein tersely told in the statement that between 1890 and 1896, nearly one hundred and fifty thousand cases of sickness were prevented and more than seven thousand lives were saved from premature death through the advice, instructions and supervision of the Board.

It is not too much to say that the State Board of Health of Michigan has, in the language of our great classic in hygiene, Edmund Parkes, made growth more perfect, decay less rapid, life more vigorous, death more remote for every citizen within the boundaries of this fair State.

And now, what of the future of the Board?

At first blush it may seem that the field of usefulness of a State Board of Health is a narrow one. On reflection, however, we will discover that its function is as broad as civilization itself. It follows the citizen in all his dealings through all his days. It begins at his birth and even before; it has him under observation whatever his occupation or wherever his mission through all his life to its close, and it keeps careful vigil at his grave until the last vestige of his remains is crumbled into the dust from whence it came. There is no situation in life that escapes its scrutiny. Every incident that lowers the vitality, that depraves the mind or that whets an abnormal appetite calls for its interference. It holds no despot's sway to club mankind along paths that are hard. It

only asks that he be normal. It teaches no abstruse philosophy, but offers hope and regeneration to the weak.

In this work of sanitation there is nothing of the spectacular. There is none of the inspiration and the glory that reckon with a nation saved or a foe repulsed by feats of arms. Nevertheless, those who study understand that the proper appreciation of sanitary science defeats man's most relentless foes and that neglect or defiance of her laws has brought destruction to nations in all time.

And right here let me say that, if unhappy Spain had no other sin than that of having maintained at our doors a preventable breeding place for yellow fever she richly deserves the wrath that has been visited upon her.

Wonderful as has been the improvement of the public health in your State and in your mortality rate during these twenty-five years, a glance at the diseases that cause the greatest number of deaths, keeping in view the increasing and broadening effect of education and the multiplying avenues for the spread of information, reveals the promise of a still greater reduction in the death rates of the future.

The greatest number of deaths in the centers of population is caused by diseases of the nervous system—the *worry* diseases. The number is steadily increasing year by year and this increase is due to the keenness of commercial competition and the fierceness of the struggle, not alone for existence, but for *wealth*.

As we grow in wisdom we may learn how utterly futile is this struggle and how utterly foolish it is to bring on a premature demise when, under the present conditions of our civilization, riches are and must be confined to the few. The only thing needful for all is a competence for declining years. It is folly to struggle a life-time for the purpose of leaving a fortune behind, with the hope that one's name and fame may live after he is gone.

The only rational way to perpetuate a name and an example is through a robust posterity.

It is an almost universal rule that those who have labored and worried beyond their endurance leave a generation of weaklings to fritter away their substance and ultimately to pass from history forever.

The lesson to be learned and the lesson that must be learned is to stop fretting and stewing one's self into the grave to leave a pitiful physical and mental inheritance to one's children.

It is difficult to trace the full benefit of sanitary work, but the cumulative force and momentum developed by twenty-five years of intelligent and well-directed education in the prevention of disease has saved to your State hundreds of lives and made it the equal of the best as a place of abode. This is seen in its present mortality rate,—now among the lowest in the land. A low rate of mortality means that death is here more remote, that here it is possible for man to reach his highest physical perfection, to enjoy his greatest immunity from disease and to postpone to the uttermost his day of dissolution.

It needs no argument to prove that such conditions enhance the value of property, make investments more secure and attract those of other places looking for the most favorable environment for living out their days in peace and plenty. As an evidence of this truth you will recall the great migration of those that are frail who seek your ports, your rivers and your wooded dells in the summer time. They come from the north,

the south, the east and the west to regale and refresh their weary bodies within your borders. Many of these visitors have in the years gone by remained as permanent citizens. The State has grown in population, in wealth, in learning, in men of wisdom and distinction until it is the peer of any State in the Union.

That this has been possible is due in no small measure to the fact that the State has been wise enough to maintain at its capital this bureau known as the State Board of Health. This Board has collected a wealth of information concerning the diseases and occupations and habits of the people that are inimical to human growth and longevity, and has poured forth each year a steady stream of information for the education and guidance of the people in the ways of health and lengthened days.

And all this the Board does without emolument or profit—only the executive force receiving moderate salaries.

That the people of the State are alive to their best interests and to the importance of the good accomplished is evidenced by the fact that the founder of the Board, who was appointed its Secretary and executive officer at the beginning, has been continued through the quarter century just ended and is still on guard.

A striking feature of the work of the State Board of Health of Michigan is its method of placing in the hands of each citizen the knowledge with which he can ward off disease.

By its conventions in cities and towns and even in villages; by its promotion of local health organizations; by lectures and institutes; and by innumerable leaflets and circulars and pamphlets and reports—spread broadcast over the State, its citizens are educated in sanitary matters beyond those of any other commonwealth with which I am familiar.

The Board has sent the sanitary schoolmaster abroad in the land—teaching, expounding, illustrating; line upon line, precept upon precept; here a little and there a little. And his first and most valuable assistant is the daily press—a fact which the astute Secretary of your Board has not been slow to appreciate.

As a matter of personal and official experience I have found no other one agency capable of affecting so much in sanitary matters as the daily paper. Unfortunately we cannot always command its assistance as fully as we would like. The absence of the sensational and the spectacular in our work limits the space given in the newspaper columns—especially when events of great popular interest are occurring.

The effect of this limitation has been so seriously impressed upon my mind during the past few weeks, and the lesson is one of such importance from the sanitary standpoint, that I venture to trespass upon your time with its brief recital.

Unusually frequent pollutions of the Chicago water supply, which, as you know, is drawn from Lake Michigan, finally led to the cutting off of the supply from the 230-odd public schools of the city in the fall of 1896. During the winter of that year and well into the summer of 1897, the character of the water supply, the question of filters, the action of the Board of Education and of the Department of Health furnished columns upon columns of matter in the daily press and were thus made the common themes of discussion in every household. Space was freely given to the regular bulletins of the Department announcing the sanitary quality of the water and to warnings against its use unless thoroughly boiled or properly filtered. Careful investigation warrants the belief

that, during this period of active newspaper discussion, between 60 and 70 per cent of the population of Chicago, including upwards of 200,000 school children, absolutely abandoned the use of the raw, untreated hydrant water for drinking purposes.

In 1896 the deaths from typhoid fever—the typical impure water disease—were 751. In 1897 they numbered only 437, or more than 40 per cent less than in 1896.

The sanitary quality of the water was substantially the same during the two years, and this forty-odd per cent reduction I regard as attributable solely to the newspaper agitation and its salutary warning effect upon the public mind.

During the early part of the present year a fair share of space and attention was given to the bulletins of the Department, and the warning to "boil the water", issued from time to time, was given due prominence and editorial emphasis, with a gratifying effect upon the typhoid-fever death rate.

Since the destruction of the Maine, however, the all-engrossing war news has monopolized the columns of the papers and, as was said in one of our recent bulletins, "the repeated warnings of the Department against the use of the raw hydrant water in its present condition do not seem to be taken seriously by the public." These warnings lack the force and effect that were given to them by editorial comment a year ago and to this I consider is due the recent increase of typhoid deaths.

Up to March 12 there had been only 79 deaths from typhoid fever this year as against 108 during the same period last year. Since that date up to the close of last month there were 279 typhoid deaths as against 112 last year. And yet the quality of the water supply during the first six months last year was distinctly worse than this year.

In this excess of deaths from a purely preventable disease, which excess in all human probability, might have been avoided by giving the same publicity to the character of the water supply as was done a year ago, sanitarians may see another illustration of the value of the press as a potent auxiliary in their labors, while Chicago has in it another cause to "Remember the Maine."

I will detain you with only one more thought which seems to me worthy of present consideration.

Natural law intends that man shall live and be useful and not that he shall be degenerate or dependent or that he shall prematurely die. The world is for man and his up-building, for the developing of his mental, moral and physical stature. The future sanitarian will broaden out upon this basis. He must educate the masses upon the known laws of reproduction and enable human beings to improve their breeding as the farmer improves all domestic animals by proper mating.

The remedy for the social evil that leaves such human wrecks in its wake—that causes such loathsome diseases and which modern knowledge has shown indirectly furnishes so much of the surgeon's practice for the remedy of disease, particularly of women, must come through a thorough dissemination among the public of knowledge now chiefly held by those of the medical profession. Let parents and their daughters once fully understand the jeopardy girls are placed in by marriage with men who have lived reckless and impure lives and there will be less need for surgeons to practice their divine art upon women in the future.

Let all understand that much of this danger and disease has its in-

centive in the semi-delirium caused by intoxicating drinks. When this is generally understood the young man who is known to be a rounder will not be hailed as a jolly good fellow, but as an evil thing to be shunned as was the leper in the days of old.

But neither the sanitary millenium, nor the social and economic millenium, nor the millenium of peace, has yet arrived. Hellish war is still waged by civilized people and, in the name of both God and the law, men are still legally marshalled out for slaughter.

Sanitary science believes in war; but its warfare does not tend either to brutalize or to destroy life, but to save it and to elevate it. Sanitarians believe in the war that regenerates and refines; the war for the defeat of Satan and the enthronement of Immanuel; a war whose weapons are reason, sweetness and light.

To all who serve in such warfare in this State, both past and present, and to those who have brought sanitary work to its present perfection, I offer my most respectful homage. It is the Master's work and I bid you God speed.

Chairman Wells—Probably few persons in the country, and certainly none in Michigan, are so competent to speak of sanitary work twenty-five years ago as Doctor Kedzie. Much of this work in Michigan he was identified with as a member of the first State Board of Health, and soon afterwards as its president. He has been a member of most of the national organizations for the promotion of public-health work, and president of several of them. Many of you have long known Doctor Kedzie and probably all of you know of his scientific labors in many fields. I introduce to you with great pleasure Prof. R. C. Kedzie, of the Michigan State Agricultural College.

SANITARY WORK TWENTY-FIVE YEARS AGO.

BY ROBERT C. KEDZIE, M. D., EX-PRESIDENT MICHIGAN STATE BOARD OF HEALTH, AGRICULTURAL COLLEGE, MICHIGAN.

In assigning to me this topic the committee doubtless expected me to confine my discussion to work done in this State, else they would hardly limit my time to twenty minutes. A preliminary glance at the men, the times and conditions of that period may not be out of place.

Physicians and the Sanitary Movement.

The physicians of Michigan always took a deep interest in sanitary matters, and were ready with voice and pen to help on the good work. Dr. Palmer, of our University, Dr. Beech, of Coldwater, Dr. Pratt, of Kalamazoo, Dr. Jerome, of Saginaw, Dr. Jenks, of Detroit, Dr. Bartholomew, of Lansing, and others by the score did good service in this cause; but Dr. Hitchcock, of Kalamazoo, was a most efficient worker in promoting the public health by organizing sanitary work.

A few years previous the cause had received a powerful impulse from Massachusetts—that grand old commonwealth—when for the common weal she inaugurated a State Board of Health. In the face of a strong plea for strict economy and diminished expenditure because of the hard times, she demanded a large expenditure for the public health, on the ground—suggested by a woman—that nothing is so economical as health,

and nothing so wasteful as sickness. Here was faith to remove mountains, and true economy won the day.

The leaven of this logic began to work among our best people, but the fermentation became especially active at the meeting of our State Medical Society in 1872, when Dr. Hitchcock in his presidential address recommended the appointment of a "special committee to carefully consider and report upon the laws of hygiene in their relations to our public schools." The suggestion was heartily approved, for the welfare of our schools lies very close to the heart of our people. The committee appointed, with Dr. Hitchcock as chairman, divided up and assigned the topics as follows: "Light in the school room," "The kind of type for school books," "The hygiene of the eye," etc., Dr. Noyes. "Methods of study, grading, rewards, kintergarten," etc., Dr. McGraw. "School government, hours of study, recess," etc., Dr. Hitchcock. "Physical condition of school rooms, warming and ventilation," Dr. Kedzie.

On account of the pressure of professional duties, Drs. Noyes and McGraw could not find time to prepare papers, but Dr. Hitchcock prepared a valuable paper on his topic, and the paper on the warming and ventilation of school rooms presented the results of analysis of air, and the distribution of temperature in a large number of school rooms during school hours. Both papers were read at a subsequent meeting of the Society, when the newspapers took up these subjects and ventilated them thoroughly, and thus did much to create a demand for sanitary reform. The Society appointed a committee to wait upon the out-going and the in-coming Governors to urge the importance of sanitary legislation by creating a State Board of Health. Gov. Baldwin gave the committee a cordial reception. When the subject was laid before Gov. Bagley his big heart beat responsive to the call. These influences and a score more paved the way for the State Board of Health.

Perhaps I dwell too long on this subject and have widely wandered into discursive fields, but the best "sanitary work done twenty-five years ago" was in establishing the State Board of Health, and for this work the State Medical Society is entitled to a measure of credit.

Need of Knowledge.

Before speaking of sanitary work done twenty-five years ago, let me call your attention to the conditions calling for such work at that time. It was before the world had availed itself of the labors of Pasteur, Lister and Koch; when the terms tubercle bacillus, antitoxine, asepsis and antiseptic were unknown, or without meaning. "The great white plague" was the creature of heredity and nourished by environment; in popular thought "the visitation of God." Then typhoid and cholera were in the air and flew with the wind—inhaled, not ingested; if you would only clasp your nose and hold your breath in the presence of the pestilence, you would be safe no matter what you swallowed. The infectious principle could be combatted by burning a few grains of coffee or a linen rag, the prophylactic power of a strong smell was popularly recognized. Not thirty years ago in an interior city a doctor calmly went from small-pox patients to visit other patients, without ablution or change of clothing, and in reply to expostulation said, "there is no danger of my giving the small-pox because I always carry a lump of camphor in my vest

pocket." The sanitarian might well take up the wail of the old Hebrew prophet, "My people are destroyed for lack of knowledge."

Potable Water.

In former years the ideal of water for domestic and potable use was

> "Sparkling and bright in its liquid light
> Is the water in our glasses."

If this was secured nothing more was required. In popular estimation *clear* water was *clean* water. It seemed impossible that bright, sparkling water could become a vehicle of disease.

Early in my medical practice I had the care of a family that had a singular aptitude to get sick, and recovery was slow and uncertain. So far as the family was concerned the cause was not obvious. Temperate, moral, regular in their habits, they had no good excuse to be sick. After weighing several possible causes of this valetudinarianism, my suspicions finally fastened upon the family well, and I suggested to the father my suspicions. He took up a glass of the water, tasted, smelled and critically examined with his eye and said, "Clear as crystal, and transparent as air! Here is no cause for sickness." The family went lingeringly down to death. The place was sold and came into possession of a family noted for vigorous health, when the old scenes of mysterious sickness came again on the stage. The well was condemned absolutely, closed up and a new one dug. With the new well the family got well and remained well.

Once the inquiry was how to cleanse water already soiled and make it fit for potable use; we asked for some Elisha to cast a cruse of salt into the spring to heal the water of bitterness and death. How slow we were to learn that germs of disease may clothe themselves with garments of light. The new demand for domestic and potable water is *innocence* not *repentance*—not healing, but health.

Drainage of Swamps.

It is a pleasing thought that many operations begun for a specific purpose introduce, incidentally, benefits outweighing the good directly sought. A good illustration is furnished in the legislation to secure the drainage of swamps, "to reclaim waste lands for agricultural purposes." The government surveys of the lower peninsula reported one-ninth of the area as swamp. An exaggeration undoubtedly. If the surveyors told the truth, they told more than the truth. But there was enough swamp land to give a bad name to our State, and impress a decided malarial character upon our autumnal fevers.

The summer and autumn of 1856 was very dry, and the fall fires that usually burn only the fallen leaves of the forests, burned out the muck swamps, burning off the roots of the marshy shrubs and trees and filling the burned-out basins of the swamps with fallen timber. The season of 1857 was very rainy and the bark and branches of the fallen timber rotting in the pools of stagnant water caused a fearful amount of malarial disease in the State; in many neighborhoods there were not enough well persons to give a cup of cold water to the sick. The mortality was not great but the suffering was very general.

The unsold swamp lands were finally donated to the State by the general government for purposes of reclamation and improvement. For these purposes the State passed a County Drainage Law, and then a Township Drainage Law, by which it was provided that where drains are necessary for reclaiming land, the expense shall be equitably assessed according to the property benefited, and right of way for a drain was secured so that no churl could stop such improvement because the outlet must pass through his land. The benefit to agriculture was great. Noisome swamps were changed to waving meadows and flocks of cattle; but the change in public health was greater still. Instead of an ague-smitten district we have become one of the healthiest states in the union. So marked has been their benefit to the public health, that in Howell's Compiled Laws, the County and Township Drainage Laws, instead of being placed under "Public Lands," are placed under the "Public Health." For both agriculture and sanitation, no more beneficent laws are on our public statutes.

School-house Architecture.

The needs of the school room—pure air, properly distributed heat, floor-space, etc.—were early considered by the Board of Health, but on one topic it spoke with emphasis, viz.: The evils of too lofty school buildings and too much stair-climbing. Observation and inquiry showed that the evil was real and growing. A certain village had erected a beautiful four-story brick house for its excellent school. Its fine proportions and lofty walls caught the public eye, and the high reputation of its school made other villages anxious to rival its house and fame, and school houses were *going up* all over the State. Against this tendency the Board lifted its voice in no uncertain tones, pointing out its evil effects on the girls while in school and the entailments that follow, lasting through life. A critic objected to "low and squatty school houses," and pointed to "the beauty of the Grecian temples with their lofty pillars and stately forms." The reply was that Grecian temples were *one-story*, and neither Gods nor Godesses would occupy a room on the fourth floor when they had to climb stairs.

The Kerosene Battle.

The petroleum products for artificial light had come into general use 25 years ago, and the kerosene lamp was found in every home. The electric light was waiting for Edison. Even in homes of wealth where gas was in use, in kitchen or garret the unsafe oil lamp was still to be found. Not only was its use very general but very unsafe. The head-line "*Another Kerosene Horror*" was seen in nearly every daily paper, with sickening details of some poor woman roasted like a martyr at the stake, set on fire by a "lamp explosion." To accentuate the danger, the cheap and inflammable benzine was sold for an illuminant under catch names, "Sunlight Oil," "French Burning Oil," etc., with preposterous recipes to make the material non-explosive. Packages of common salt colored with aniline, sold to "kill the gas," etc., filled the homes with danger, and hearts with dread. These special sources of danger confronted the State Board of Health at the very threshold of their duties. The oil was improperly refined, too much of the volatile materials retained in the kero-

sene, and no certain method of inspection was in use, the testing of the oil being too largely within the personal control of the operator. When the Michigan Oil Tester adopted by the Board, with closed cup inspection and the flashing point as the line of danger, were made the legal method of testing, and a State Oil Inspector to have charge of this business, then the people found a safe light.

The battle, however, went on for nearly twenty years in newspapers and in legislative halls, often with great bitterness and frequent changes of the law, but two legislative sessions have passed without a serious effort to change the law, and people are forgetting the dangers of former years.

I have thus briefly brought before you some of the "sanitary work done 25 years ago." How meager the resumé. But the best sanitary work is not that which may be pronounced "done"—ready to be labeled and filed away on the dusty shelves of history. It is rather the kind of work which is self-perpetuating, a stream that grows broader and deeper as it flows, bearing life and healing to every plain it touches.

There are two ways by which we may attack sanitary evil; by *light*, or by *lightning*. Among a free people the surest if not the quickest way to remove any great evil is to clearly point out the evil itself, its extent and its effect; many interests injured or at least threatened by the evil, without concert silently place themselves in opposition; a thousand eyes are at once turned to the examination of this evil and its tendencies; that wonderful and complex phenomenon which we call "a change in public opinion" ensues, and the evil finds it must take itself out of the way, for it has no home amid a hostile people. In this way the wrongs which threaten society in mass, right themselves when brought to the bar of enlightened public opinion. Such rectifications are the more permanent and abiding because they take place by the action of natural laws and not by the exercise of arbitrary authority. The silent forces are the most powerful; the noisy and loud-mouthed forces dissipate half their energy in the very noise itself. The boom of the cannon is brag, but the hurtling shell is power. The best work of the sanitary reformer is by *light* rather than by *lightning* where rending forces with deafening noise and choking dust lay low the ramparts of wrong. Let in the blessed sunlight, silent but potent, which renews the face of nature, and morning by morning reveals a new world.

In this line of work—advisory, not mandatory—the State board inaugurated

Sanitary Conventions.

The prime object was to diffuse information on sanitary subjects among the people, and to secure the co-operation of all classes in promoting public health.

In entering upon sanitary work the Board had high aims—*too high*—for we shot over the heads of common people. This is the fault of all raw troops, and we had yet to learn and follow the precept of experience, "shoot low." To bring our work down to the breast level and thus reach the heart of the people, the Board in 1878 inaugurated Sanitary Conventions to reach the laity, and secure the co-operation of men and women of all ranks with the experts in sanitation. Dr. Lee is to speak on this subject and I will trench upon his ground only to say that the

work already accomplished in practical Sanitation in this State through these Sanitary Conventions is incalculable, and the future opens a wide door of usefulness along this line.

Afternoon Session, Tuesday, August 9, at 2 P. M.

Chairman Wells—The meeting will come to order. The various lines of work which have engaged the attention of the Michigan State Board of Health will occupy most of our time this afternoon. Distinguished sanitarians from abroad, who have had practical experience in these various lines, have been asked to present their views upon them at this time. "Educational Work of the Michigan State Board of Health, including the work of the State Laboratory of Hygiene", is the first subject upon the program. This will be considered by Prof. C. A. Lindsley, M. D., Dean of the Medical Faculty of Yale College, ex-President of the Conference of State and Provincial Boards of Health, and President of the American Public Health Association. I introduce to you Prof. Lindsley:—

EDUCATIONAL WORK OF THE MICHIGAN STATE BOARD OF HEALTH, INCLUDING THE WORK OF THE STATE LABORATORY OF HYGIENE.

BY CHARLES A. LINDSLEY, M. D., PROFESSOR EMERITUS IN YALE COLLEGE, NEW HAVEN, CONN.

A pleasant duty has been assigned to me today, to outline for you the work which your State Board of Health has accomplished during the twenty-five years of its interesting and illustrious career. It is always pleasant to repeat the story of success and progress. Because success implies efforts put forth, difficulties conquered, and achievements won. And that pleasure in this instance is enhanced by the consciousness that the victorious conflicts of the past have been so steadily progressive towards the object sought, and have been so rich in fruitful experiences as to give assurances of still future victories, of still better success, and of an onward progress in the great work of humanity which has been undertaken.

The State Board of Health of Michigan is among the oldest in the Union. Not only because of its early establishment, but much more by its judicious and energetic action, it has been a conspicuous symbol of the intelligence, the well-directed enterprise, and wisdom of the people of Michigan. It has been a pioneer, in what was at the time of its organization almost a new field of work in this country.

Under the skillful leadership of its able and accomplished Secretary, it has proved a guiding star, to illumine the way and encourage other and younger organizations in the same work.

Before, however, we make any direct reference to the many and important results which it has achieved, let us briefly consider what we ought reasonably to expect a State Board of Health to do.

What is its mission? What are its functions? Its mission is to preach the gospel of public health to all the people. And to that end its first and foremost requisite is, to be well informed in sanitary science; to

chief functions will be to teach the people the laws which concern the maintain an up-to-date acquaintance with the science of sanitation; for that is the foundation upon which its public utility will largely depend.

In that capacity, as a fountain and source of information, one of the health of communities, and especially, how to apply them.

Sanitary laws are discovered and recognized by the carefnl and intelligent observation of facts. (A single fact by itself is of little value.) But the accurate observation of a large number of facts, admitting of classification and comparison, and corroborated when possible by experiment, are the means by which a knowledge of the laws of nature is acquired. When such laws are tested and verified and found to be unchangeable, we call such knowledge, *Science.*

The knowledge of natural law is science. Sanitary Science is a knowledge of the laws which govern in any way the physical development, the functional activity, the mental growth, and even the moral character, of the citizen, from his ante-natal existence even to the celebration of his funereal rites.

The laws of sanitation with which a State Board of Health is mostly concerned are those which point to the dangers, the whirlpools and the perils, that beset the ship of life throughout its course, and so chart out the voyage that it may escape the tempests of disease and avoid the rocks of hostile casualties and thus be piloted in safety to the haven of a good old age.

Some of the best-known sanitary laws were very slow of recognition. For instance, nothing is better established than that certain diseases are contagious, and yet that law was not self evident, nor generally accepted until after generations of experience and inaccurate observation.

It is within the memory of the speaker that men standing high in reputation, for intelligence and learning, both in and out of the medical profession, denied the law of contagion, and vigorously disputed the facts upon which it is based.

And, on the other hand, the recognition of a sanitary law does not always depend upon the man of science, but is sometimes discovered and utilized by the common people.

In a large old book in my library, written more than 150 years ago, by Richard Mead, M. D., the most noted medical man of his day, Court Physician to George II., I find the following account of the discovery of a most important contribution to sanitary science:—viz:—that inoculating small-pox modifies the severity and duration of the disease.

Dr. Mead writes:—"As far as I have been able to find out by enquiry, inoculation was the invention of the Circassians, the women of which country are said to excel in beauty; upon which account, it is very common, especially among the poorer sort, to sell young girls for slaves to be carried away into the neighboring parts.

"When therefore it was observed, that they, who were seized with this distemper, were in less danger both of their beauty and their life, the younger they were, they contrived this way of infecting the body, that the merchandise might bring the greater profit." From this discovery the practice of inoculation for small-pox became common throughout civilized Europe, and about 100 years ago was introduced in this country and very generally adopted, until superseded by the safer method discovered by the immortal Jenner, viz:—Vaccination. And even that, was the prior discovery of the English milk-maids, who told the Doctor, that they were

not afraid of small-pox, because they had had the cow pox. And Jenner took 20 years of careful enquiry before he ventured to announce the protective power of vaccination.

The laws of sanitary science are many and varied. The subject covers a very wide field of investigation. It includes legitimately within its scope, the habitations of men, their modes of living, their occupations, their water, air, and food supplies; even their social relations, in short whatever influences the longevity of the human race, or concerns its vitality and health. It is also a progressive science, and its progress is as ever before, dependent upon the accurate observation, classification and comparison of facts, in their relation to man's physical health.

Hence it is that the basis of the science is Vital Statistics: An accurate and full knowledge of the length of life in a given community, the birth-rate, the marriage-rate, the death-rate, and the causes of death. Here permit me to congratulate the people of Michigan, that your State Board has carried the education of your legislature so far, that at its last session it enacted a law for the more perfect registration of deaths throughout the State, by requiring a certified statement of the fact with certain particulars and a permit to be issued, before the burial or removal of the body. It was a most important step in the cause of sanitary science. It will speedily demonstrate its usefulness, and lead inevitably to other desirable reforms in registration. It is a consummation which your State Board has long been striving for, and which they long ago would have realized, if legislators had fully appreciated, that the administration of public sanitation is founded on a rock-bottom of science, of which vital statistics is the chief corner-stone. The idea has prevailed too much in the popular mind that public-health laws were a sort of fad of individuals, an impracticable hobby of a few enthusiastic and visionary people, generally doctors, who must have some scheme in it for their own interest. The populace has made the tremendous jump from the premises to that conclusion, by the simple logic involved in the question, "Why else should doctors before all others be so persistent in advocating them?" As if the measure of every effort for the public good were grounded in selfishness, as it so often is with politicians!

The most essential element of success in the administration of Public Hygiene is public coöperation; an intelligent appreciation on the part of the people that the work of State and local boards of health is simply *applied sanitary science.* It is merely the employment of what the people call business principles and common sense, to the observance of those conditions and that environment which by the ordinances of the Supreme Ruler of the Universe are most conducive to the health of communities. The State Board of Michigan recognized the necessity of such coöperation, and has strenuously and persistently sought to secure it by its unremitting efforts to educate the people. Its work in that direction has been characterized by a practical directness and efficiency unsurpassed by any organization in the country. It has not been satisfied with the publication of an annual report, which although replete with valuable information, reaches but a small portion of the people. But it has secured their attention and interest far more successfully and effectively by other means.

Your Board was among the first to recognize in its plan of instruction *that men took most interest in what concerns them personally.* Hence the Board seized the opportunity on every occasion of an outbreak of a con-

tagious disease to circulate in the families so afflicted and among the neighbors, full printed instruction for the restriction and prevention of the disease; well assured that the waste basket at such a time will not receive them until they have been studiously considered, and their counsels put in practice. In short, your State Board of Health, with a wisdom that is beyond criticism, has taken the people into its confidence, has frankly told them what it wished to do for the public good; has told them just how it is to be done, and how much they can help in its accomplishment. It has not arbitrarily undertaken the work alone, but, with commendable judgment, has not only sought the aid so necessary to success but has adopted the wisest methods to secure it cheerfully and even zealously. By such wise measures, the administration of public sanitation has been established in your State upon a basis of organic unity, in which not only the State and local boards are joined, but every reputable and intelligent citizen and householder in the State, feels also the responsibility of being a health officer to his own domicil.

Your board has not only told the people what to do, but it has justified its course, and confirmed its teaching, by keeping in the public eye the results of its work, by means of those graphic illustrations, showing the diminished prevalence of contagious diseases, which although covering only a page, are conspicuous across the room, and which are so familiar not only to you, but to every reader of sanitary literature throughout the United States.

With a boldness, born of experience, and an assurance of the confidence of the public in its discretion and judgment, it ventured, before any other State Board, to include consumption in the list of communicable diseases that must be reported to the health officer, as soon as it is recognized. Consumption having now found its legitimate place among the infectious diseases, the Board could not logically avoid taking some direct supervision of it, as it does of other diseases of the class. Nevertheless there are reasons why the act required a courage, that most other Boards of Health have failed to exhibit.

It is significant of the respect in which the State Board of Health of Michigan is held by the people.

Numerous and varied fields of service, requiring skill and learning in the administration of public hygiene, are yet to be developed by the conditions which progressive civilization is constantly producing. In no department of human activity is there afforded better opportunity for philanthropic effort, with promise of rich results than in those undertakings for the protection and improvement of the public health so wisely inaugurated and auspiciously pursued by the Michigan State Board of Health.

Politics. There is no party politics in sanitary organizations, or there ought not to be, because it is as destructive to their usefulness as the typhoid bacillus is to the human subject. Hence it follows, as the night follows day, that public sanitation has no attractions for the ordinary legislator. He is never a leader in sanitary legislation. The approval of all such legislation is forced from him by the enlightened sentiments of his constituents. Any instance of a sanitary law, originating in a legislature, would be justly quoted in support of the theory of spontaneous generation. Therefore, that your legislature has enacted so many excellent laws through the instrumentality of your State Board of Health,

is to be taken as the highest proof of the advanced education of the people of Michigan in sanitary science.

The motto of your Board is evidently "Excelsior"; for not content with what it has achieved, it has recently taken a step, in advance of all other State Boards, in the dissemination of practical knowledge relating to health, by beginning instruction, where all rudimentary instruction should begin, with the children. Your legislature, instigated by your State Board, and quite assured that it is not preceding, by any dangerous distance, the sentiments of the voters, has enacted a law, "That there shall be taught in every year in every public school in Michigan, the principal modes by which each of the dangerous communicable diseases is spread, and the best methods for the restriction and prevention of each such disease." (Act No. 146, Laws of 1895.) It is a master stroke of policy. The children of today, will direct the sanitary administration of Michigan twenty years hence, on the principles taught them now.

Sanitary Conventions. Your State Board has ever kept prominently in view the duty imposed upon it, "to disseminate among the people, all useful information on the subject of hygiene." No more practical and effective method has ever been devised, than the holding of local sanitary conventions in the smaller towns in various parts of the State; a method which originated with your Board and has been successfully carried on for nearly twenty years. It has long been known that tracts and bibles without the presence and personal efforts of missionaries, would never convert the heathen. Hence the wisdom of these missionary conventions.

Of their utility as a means of diffusing a knowledge of the laws of health; of their power in stimulating an interest in the principles of sanitary science; and of their agency in enlisting new recruits in the army of workers, and of the practical local reforms and improvements which have been suggested and acomplished through them, it is unnecessary for me to dwell. You are already familiar with these results.

I pass to another subject—

STATE LABORATORY OF HYGIENE.

I have said Sanitary Science is progressive. So also is the work of a State Board of Health. It was simply the result of natural growth that when it had reached a certain stage in its development, it should feel the need of and provide for a Laboratory of Practical Hygiene.

The time always comes to every well-organized and active State Board, when an institution of that kind is an indispensible necessity to its highest usefulness. No better evidence of this can be offered than the very valuable work which has been done by your own Laboratory. Its detection of frauds in medicine; its discovery of poisonous ptomaines in common articles of food; its examinations of water supplies; its investigations into the sources of epidemics; its bacteriological work, and, in many ways beside these, it has proved its abounding usefulness as an essential adjunct to the outfit of a well-equipped working State Board of Health. It is not only directly valuable in affording the means of solving the hundred and one problems that from time to time present themselves, but it is indirectly of great educational influence by illustrating in a very practical way, how closely the lives and the health of the people are connected with purely scientific investigations.

It is to be kept ever in mind that, although the State Board of Health is an executive body, it is not clothed with mandatory powers, its functions are wholly advisory. The great work which it has accomplished it has achieved almost entirely by educational means, and this Laboratory will stand, as it has stood ever since its establishment, an object lesson, extending, illustrating and emphasizing the teachings of the Board.

The great future of public sanitation it is difficult—aye, impossible to predict. Some writer, gifted with a prophetic mind, whose words I can only quote from memory, has said: "I saw a vision, a civic procession of great pomp and elaborate display, in which appeared in person all the high dignitaries of State, surrounded by their respective staffs, emblazoned with the full official insignia of their rank. These were on foot, marching in stately measure to the grandest music; and there was still another officer, apparently one of still higher rank, wearing his official robes, and seated in a chariot of most costly structure, to whom all seemed to render obeisance and honor. I asked who is this? The reply was, 'That is his High Excellency—the Commissioner of Health.'"

Chairman Wells—Will Judge McAlvay take the chair for a short time?

Acting Chairman McAlvay—The next subject this afternoon is Sanitary Conventions, by Benjamin Lee, M. D., President of the Conference of State and Provincial Boards of Health of North America, and I take pleasure in introducing Doctor Lee:—

STATE SANITARY CONVENTIONS.

BY BENJAMIN LEE, A. M., M. D., PH. D., SECRETARY OF THE STATE BOARD OF HEALTH OF PENNSYLVANIA, AND HEALTH OFFICER OF THE CITY OF PHILADELPHIA.

The proverbial unwisdom, not to say, presumption, of the merchant "who carried coals to New Castle," was both sagacity and modesty compared with the audacity of one who dares to appear before the Board of Health, now grown to adolescence and maturity, of this great State, and make pretense of saying anything new and interesting, or conveying information to its members, on the topic on which I am announced to speak. I can only say in self-defense, that the subject is not one of my own selection. I deem it indeed an unusual compliment that the Secretary of your Board, himself a veteran in management of meetings of this character, should have requested me to speak to you with regard to this valuable means for disseminating information among the people in reference to the preservation of life and health, not the least important among the manifold duties assigned to your Board and mine, and probably to all State and Provincial Boards of Health. Let us consider for a moment the history of this movement:

The first State Sanitary Convention of which we have authentic records, was held on November 1, of the year before Christ 1451, in the midst of a large plain about equi-distant from five considerable towns lying on or near the river Jordan. The sessions lasted more than a week, and were attended by immense audiences. The principal address on this occasion was delivered by a Hebrew savant named Mesu or Moses, the most

learned and accomplished scientist of his day. His early life was passed in the court of the most magnificent empire of the times. His education was confided to private tutors, and no pains was spared to make it complete and thorough. His were the secrets of the heavens above and of the earth beneath and of the waters under the earth. This training included not only the cultivation of his mind and furnishing it with all the lore of the schools, but scrupulous attention to the development of his bodily powers, and the acquirement of proficiency in athletic sports and military exercises. His great bodily strength was unfortunately evinced soon after reaching manhood by his killing, with a blow of his fist, a man with whom he had an altercation. This led to his banishment from the court and his flight from the country. Then followed a period of close communion with Nature, during which he had an opportunity to digest and formulate the knowledge he had received from his princely tutors, and to cultivate the spiritual side of his nature, while, at the same time, in the simple, hardy life of a shepherd, passed entirely in the open air, he still further developed his physical powers, and laid the foundation for a robustness of constitution rarely paralleled. Needless to dwell on the magnificent achievements of his maturer years; his heroic efforts for the release from slavery of a long-oppressed race, writhing under the tyranny of a proud, avaricious and blood-thirsty dominant nation; his magnificent military enterprises; his marches and counter-marches; his battles and surprises; his wise statesmanship and his wonderful control of a turbulent and self-willed people. He appears before us now, at the close of his stormy and eventful life, having more than passed the century mark, and yet in the full possession of the vigor of his early manhood, with his keenness of vision and his natural forces unabated. Surely such a man, if any, had a right to call a State Sanitary Convention. The program on this occasion was comprehensive and varied. Among the topics treated were:—

The Importance of the Inspection of Animals intended for Use as Food.

The dangers resulting from the Use of the Meat of Animals which are unclean Feeders.

The Proper Method of slaughtering Animals to be used as Food, and of the Preparation of the Meat.

The Danger of using Meat which has begun to putrefy.

The Value of a combined Animal and Vegetable Diet.

The Dangers arising from the Use of the Meat of Animals which have died a Natural Death, or have been killed by Dogs or other Animals.

The Diagnosis of Leprosy.

The Differential Diagnosis between Leprosy and other Cutaneous Affections.

Leprosy both a Contagious and an Infectious Disease.

The Necessity for the absolute Isolation of Lepers.

The Importance of Quarantining those who are suspected of being affected with Leprosy or other Contagious Cutaneous Affections.

The Necessity for the Destruction by Fire of infected Clothing and Bedding.

The Importance of scraping and replastering the Walls of infected Apartments.

The Hair and Beard considered as a *nidus* for the Development of the Germs of Disease.

The Occasional Necessity for the Destruction of infected Houses.

The Dangers arising from the Use of a Polluted Water-supply.

The Importance of Washing the Hands before Eating, and of scrupulous Cleanliness in the Preparation of Food, of Cooking Utensils and of Articles of Table Furniture.

The Unwholesome Character of Meat which has been bruised or crushed during Life.

The Dangerous Deterioration of Yeast in hot Climates.

The Cremation of Offal and Garbage.

The Purification of the Atmosphere by burning Aromatics.

The Cultivation of a high Standard of Morality essential to the Maintenance of Public Health.

The Importance of Personal Cleanliness and frequent Ablutions.

The Sanitary Relations of the Sexes.

The Dry-Earth Treatment of Human Excreta.

No better evidence could be desired as regards the value of Sanitary Conventions than the results which followed this memorable gathering. Its proceedings, formulated into a Code, were preserved with the greatest care, a night and a day watch being kept over them, and the entire people were constantly instructed as to their contents. As a result of strict adherence to these sanitary laws a race of the greatest vigor was developed. Prosperous in peace, invincible in war, they were the terror of their enemies and the envy of all surrounding nations. At length, however, they grew lax in the observance of hygienic requirements. Disease, luxury and licentiousness sapped their strength, and they became the prey of those over whom they had formerly triumphed. Finally, a condition was reached of the most absolute degradation, in which the very existence of a written Code seems to have been forgotten. At this time, about eight hundred years after the Convention referred to, a second Convention was called.

The occasion of this assemblage was the somewhat remarkable discovery, after so great an elapse of time, of the original Code, hidden away under rubbish in the ruins of an old temple. The King then on the throne, profoundly impressed with the importance of this discovery, immediately ordered a convocation for the purpose of again making the people familiar with the requirements of the Code. This meeting was held in the month of March in the year before Christ 623. Like the former it was attended by immense throngs, men, women and children, and lasted over a period of several days. With the return of a better and simpler mode of living, and the strict observance of the precautions of the Code, prosperity again returned to the race, and for centuries again they acquired a wonderful preeminence.

History is dumb as to any future assemblages of this kind until we come down to the present century, during which, from time to time, those who were intrusted with the management of seaboard quarantines, met together in Europe to discuss topics more especially connected with the performance of their own specific duties. These, however, could scarcely be called State Sanitary Conventions.

The last war in which our country was engaged was the starting point of many new movements in this country of a most beneficent character, and among those we are probably safe in classing State Sanitary Conventions. Out of the furnace of that war came a second Moses. Like the first, educated not only in the sciences, but having had also the train-

ing of a military experience, he had not failed to note, when in the army, that the number of deaths which take place in battle is comparatively small compared with those which result from disease, and that the chief duty of the army surgeon who has any just comprehension of his responsibilities is, not the administration of drugs or the amputation of limbs, but the insistence on the observation by the soldier of every possible precaution for the preservation of health, and by his superior officers of such measures as will enable the soldier to carry out these precautions. In other words the hygiene of the camp and the march were of infinitely greater importance than the treatment of disease and the curing of wounds. It did not take him long on returning to civil life to adapt his newly-acquired knowledge to the ordinary conditions of existence, and he at once set on foot a propaganda with the object of arousing interest in this question among the people of his State, Michigan. In language almost prophetic of his future career, he declared that, "Grander victories, of greater importance to the people remain to be achieved than any which have heretofore resulted from warlike methods. To the peaceful hero, who shall call forth and so marshal facts and generalize the scattered forces of knowledge as to lead to a victory over any one of the prominent causes of death which now annually destroy our citizens by hundreds or by thousands, humanity may well accord a higher praise than to the most successful of warlike generals." Owing to his persistent and energetic efforts, the inertia which possessed the legislature of that State, in common with all others, in regard to movements of a scientific character looking to the general good of the people, was gradually overcome.

As I dictate these words I am reminded that it is the exact anniversary of the day on which the first meeting of the State Board of Health of Michigan, the result of these earnest and conscientious labors, was held. It was not, however, until five years later that the veteran Kedzie, whose name is held in reverence by all sanitarians in the United States, in his Presidential Address before the Board, stated the proposition that one means, and a most important means, of disseminating knowledge respecting diseases and useful information on the subject of hygiene among the people as required by law, would be to assemble the people in different parts of the State, and to talk to them face to face, instead of depending on printed documents alone for the conveyance of information. This suggestion was immediately acted upon, and the first State Sanitary Convention of Michigan was held in this city in the month of April, 1879. We are told that "all who were in attendance at this Convention were well pleased, and regarded the work done as equal to the anticipations of its most enthusiastic friends." That these meetings have gone on increasing in interest and usefulness we may fairly conclude from the fact that up to the present time forty-five have been held; the next to the last having also taken place in this city at the close of last year. Considerably more than two conventions a year have therefore been held since the inauguration of the movement.

The Pennsylvania Board, coming into existence twelve years later than your own, naturally attempted to gain, from the experience of that and other older boards, hints as to the best methods of carrying on its important work. It was deeply impressed with what seemed to be almost a specialty of the Michigan Board, the frequent occasions on which, like Moses of old, it called the people together to hear the words of the

sanitary law. The method commended itself to the judgment of our members, and we initiated the movement by a Convention in Philadelphia, the métropolis of our State. With a program on which appeared the names of the most distinguished sanitarians of the entire country, and which was probably richer in papers of sterling scientific value than that of any sanitary meeting ever held in the United States, except possibly those of the American Public Health Association, after months of advertising, both in medical journals and in daily papers, and with a conspicuous placard posted many weeks in advance in the most frequented center of the city, we found ourselves at the opening session, with the Governor of the State and other high dignitaries representing all professions on the platform, confronted by an array of empty benches as chilling in their effects as the *plasmodium malariæ*. We found to our dismay also that a considerable portion of this meagre audience was composed of our friends from a distance who were to read papers. It is true, the rains descended and the winds blew and beat upon that house—the weather did its worst—but although we stoutly maintained to each other that this was the cause of the scanty attendance, we none of us, in the slightest degree, believed the assertion. No, we were compelled reluctantly to admit that the one million people who inhabited the city of Philadelphia didn't care a ———, well, didn't care whether the Convention "kept" or not. The city went on its way rejoicing, and recked not of our efforts or our disappointment.

What then had been our mistake? Why did not the thronging multitudes, whom our rosy dreams had pictured as crowding the audience room, which indeed we had feared would not contain them, materialize in response to our call? Our mistake consisted in having the Convention in Philadelphia at all. The cares, the distractions, the business, the amusements of the great city were too engrossing and overpowering to allow our puny efforts on behalf of the good of the people to make any impression on them. A great city is not the place for a State Sanitary Convention. This was the first lesson we learned, and in the main we have profited by it, as I advise any Board which contemplates inaugurating this work to do. The second lesson was that it is unwise to attempt to get the largest hall in a town in which to hold your Convention. The local committee will always make this mistake if not warned against it.

The most fruitful fields for such efforts are small towns, in which for the time being the Convention will be the great and controlling interest, the one grand attraction. To reduce the statement to a mathematical proposition I would say, the size of the audience at a State Sanitary Convention will be inversely as the square of the population of the place in which it is held. Of course I am not saying that, even in a country village, it can compete with a circus or a minstrel show. It is well, therefore, if possible, to avoid coming in competition with any first-class attraction of this kind. The best possible places are educational centers, university towns, and Normal School villages. In such places the pace is set by people of intelligence, the outside diversions are few, and arrangements can also often be made by which the older students will be present, not only to fill up the benches, but to constitute an audience at once appreciative and valuable. I can imagine no more inspiring sight than the thousand eager, intelligent faces of the pupils of one of our Normal Schools of both sexes, in whose chapel one of the sessions of our last Convention was held. The seed there sown, moreover, fell on

good ground, and will bear fruit all through the State. Manufacturing towns as a rule are not propitious spots for such meetings. The people work hard all day and are fagged out at night, and, if they go out at all in the evening, wish and need to be amused rather than instructed. I can conceive of no more unsanitary procedure than to invite such people to spend an evening in a hot, stuffy hall, vainly endeavoring to fix their attention on subjects which they can only partially comprehend.

Of course much of the success of a convention depends on the personality of the promoter. As I read the accounts of the conventions which so rapidly succeed one another in this State, and the machine-like precision with which they move, it seems as if the Moses of this "pleasant peninsula" had but to wave his staff and smite the flinty hearts of the citizens of any desired place, and, *presto*, the health-giving waters flow forth; the popular preacher gushes with hygienic eloquence, the leading lawyer spouts streams of off-hand sanitary lore, and the prominent politician blows with one breath the trumpet of public health and his own.*

Now a word as to the arrangement of the program. "A prophet is not without honor save in his own country". The politicians of Moses' day and nation had a very small opinion of his abilities and freely expressed themselves to that effect. I once overheard a doctor saying to a friend, as they came out arm-in-arm from a Medical Convention, before which I had been reading a paper, "I have a good deal better opinion of that man Lee than they have in Philadelphia." It is well, therefore, to have at least one name on the program of a well-known man from a distance, preferably from another State, as a drawing card. In Pennsylvania we have several times been so fortunate as to avail ourselves for this purpose of the abundant material of this kind furnished by the Michigan Board, twice, if my memory serves me right, in the person of its Secretary, and once in that of the brilliant and gifted A. Arnold Clark. I deem it a privilege to have an opportunity in this presence to bear testimony to the profound and lasting impression made by that earnest and eloquent young sanitary enthusiast on his audience on that occasion. Is it not a melancholy commentary on the inadequacy of our sanitary precautions as yet, that the title of his intensely interesting address was, "The Germ Army and how to Rout It"? Poor fellow! Within two short years he had himself fallen under the combined onslaught of the two most formidable divisions of that army.

Residents of the town, however—local talent, as it is called—must be depended on to furnish the greater number of the papers—and this for two reasons, first, because the resident is more familiar with the local conditions, in reference to sewerage, drainage, water-supply and sanitary measures generally, which ought always to be freely discussed, than a stranger can be, and secondly, because, having once been induced to compose and read a paper on a sanitary subject he will be ever after a sanitarian. This result is unfailing. I have sometimes, however, resorted to the plan of having an inspector visit the town shortly before the meeting to spy out all its hygienic short-comings and iniquities, and serve them up as a dainty dish for the delectation of the inhabitants. This expe-

* In explanation of how the staff is waved, as soon as the topics and speakers are selected the card catalogue of the State Board of Health library is searched through for every topic proposed to be written about or discussed at a sanitary convention, and everything in the library, especially all the most recent literature likely to be useful to either the "popular preacher," "leading lawyer," "prominent politician," or other person who is to take part in the convention, is sent to that person by express, charges prepaid. The author has then only to choose from the best that can be selected from what has been written on his subject.

dient may be relied upon to produce a somewhat spicy and animated discussion.

Shall "Music, Heavenly Maid," have a place on the program? The majority of our Board at first opposed this device as not being sufficiently scientific and dignified. We have since seen the folly of our way, and now avail ourselves of every opportunity to enliven the gloom of the proceedings by this means. Many who come only to listen to the music, if not to scoff, may remain to become sanitary saints.

It must be remembered, however, in this connection, that the audience which the speaker sees before him is by no means the entire audience that he addresses. The daily press carries his lessons to every home in the town and in the neighborhood for miles around. I was comforted at our first convention, to which reference has been made, when I saw the reporters' table well filled. Like the poor, we have these ready scribes always with us. I knew they were mis-spelling the names of members, and assigning papers to the wrong authors, and accurately describing men who were never in the convention at all, and indulging in witticisms at the expense of the Board, but all the same they were letting half a million people know that the convention was going on, and inducing a quarter of a million of people to give some heed to what it was doing, and to read some of its valuable papers. So that our work, after all, was far reaching in its results.

It must also be borne in mind that the number of persons present at any one moment by no means represents the number of those who are present at some time during the sessions. They are continually coming and going, and in this way the actual personal influence exerted is greater than the apparent.

On the whole are the results of State Sanitary Conventions satisfactory, and commensurate with the labor and expense which they involve? I answer unhesitatingly—Yes. Every convention of which I have had personal knowledge has left its impress on the town in which it was held. The local health authorities have gained new courage for their difficult and often unwelcome labors, while on the other hand the people have become more appreciative of their public-spirited efforts. New sanitary measures are often inaugurated under the spur of the momentary interest and excitement.

A city in which we met a few years since was treating its sewage in a most unsatisfactory and archaic method, greatly to its own detriment and that of its neighbors. This was freely animadverted on. Now this city has a sewage-irrigation farm of seventy acres, from which an entirely innocuous effluent is poured. In another city a special convention was held to consider the conditions contributing to the pollution of the stream on whose banks it stands, and which constitutes the chief water-supply of an immense population. That city was at that time without a sewerage system. It has since introduced one, but has taken pains, at a great expense, to protect the stream by the simultaneous introduction of a mechanical filter plant at the end of its system, which is doing excellent work. A movement for an improved water-supply often originates in this way.

So that I, for one, feel, that in face of the depressing influence of meagre audiences, and an apparently apathetic public, there is sufficient reason for continuing such efforts, as a reasonable and valuable method of diffusing a knowledge of sanitary science among our people.

I trust I shall not be driven ignominiously from the stage if I quote the effusion of a patriotic poet in reference to a recent event which has now become historic, as expressive of my attitude on this question.

"Oh, dewy was the morning
Upon the first of May,
And Dewey was the Commodore
Within Manilla Bay,
And Dewy were the Regent's eyes,
Those orbs of royal blue,
And do we feel discouraged?
I do not think we do."

Acting Chairman McAlvay—The next subject upon the program is "Annual Conferences of Local Health Officers", by Dr. C. O. Probst, Secretary of the Ohio State Board of Health. Ladies and gentlemen. I take pleasure in presenting to you Doctor Probst:—

ANNUAL CONFERENCES OF LOCAL HEALTH OFFICERS.

BY C. O. PROBST, M. D, SECRETARY STATE BOARD OF HEALTH, COLUMBUS, OHIO, AND SECRETARY OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Mr. President, Ladies and Gentlemen:—The organization of Local Health Officers' Associations belongs very largely to the last quarter of this Quarter-Centennial of Sanitation that we are celebrating today; and it promises to be an important factor in advancing the cause of public sanitation.

I have endeavored to learn the form of organization and modes of procedure of the sanitary associations, and of the associations of health officers of the States and Provinces having such organizations, and from this and the experience of my own State, to formulate briefly the conclusions reached as to how annual conferences of health officers can be made most successful.

By health officers is not meant the officer or person usually appointed by a board of health as its executive, but all persons appointed under the law as members of boards of health, or for public sanitary duty.

Men of all occupations have found it advantageous to "get together", and we have legal societies, humane societies, trades assemblies and various other associations, too numerous to mention. The reasons for association are obvious. The best possible way to easily gain accurate information of any subject one is engaged in studying is to discuss it with others who are also making a study of it. A generous rivalry for the best individual work, and an *esprit de corps* when concentrated action is required, is also engendered by such associations.

A celebrated American divine and author some years ago made his first trip abroad. He is known at home as an indefatigable worker. On his return he told a friend that he found the theologians of Germany were accomplishing more in six or seven hours' work than he had been able to accomplish in ten or twelve. The reason, he said, was association.

Almost nightly a small circle gathered around a table in some public garden and the day's work of each, if of general interest, was discussed amid pleasant surroundings. Each one thus absorbed the essentials of ten or a dozen. I might add that the American divine expressed a sincere regret that conditions in this country made it impossible for him to form here such profitable associations.

A few of the States and one or two of the provinces of Canada have formed health officers' associations. In some of the other States there are sanitary associations to which health officers may belong. A sharp distinction, I think, should be made between a sanitary association and an association of health officers. Each has its own field of operation, and neither can entirely take the place of the other. An attempt to combine them will leave essential work undone. As witnessing the desirability of this separation of work, we may point to our National sanitary organizations, which are, on a larger scale, an exact counterpart of our State sanitary associations and State health officers' associations. Our American Public Health Association opens its doors to all who are interested in public health matters, and is a sanitary association. The American Association of State and Provincial Boards of Health is made up exclusively of health officials. It is true that members of State and Provincial Boards of Health are among the most active workers in the other association, and our health officers should, and are likely to be, active members of State sanitary associations.

To the Michigan State Board of Health belongs the credit, so far as I have been able to learn, of having pushed the work of sanitary conventions beyond that of any other State. It has carried the gospel of sanitation into all its lands, having since the year 1880 held under its auspices forty-five sanitary conventions in as many different cities and villages. The good results of such work can hardly be overestimated, and should be prominently mentioned on this, its quarter-centennial day, in recalling the many good and precious gifts the State, through its board of health, has given to the people of Michigan. Michigan has also organized an Association of Health Officers.

It is, however, not of sanitary associations but of associations of health officers of which I am to speak. What is their best form of organization, and how can they be made the most useful? Doubtless there will be differences of opinion on these subjects. We must bear in mind, however, that differences in the laws and conditions of the various States and provinces may enter into the question.

State associations of health officers may be spoken of first. It is the writer's belief that these should be under the direct control of the State Board of Health. Many reasons may be given in favor of this. First is the question of expense. Meetings of the association, to be of the greatest value, should have their proceedings reported, published and distributed to all members of boards of health, and to other persons specially interested in such matters. In my State it takes about twelve thousand copies of proceedings to supply members of boards of health. The cost is annually four to five hundred dollars. The postage alone on this number of reports would be quite an item, but Ohio, like many other States, publishes a monthly journal, admitted to the mails at pound rates, which effects quite a saving. The proceedings may be published in the annual reports of the State Board of Health, but these reports are usually late in appearing—possibly a year or more after the meeting

—and the proceedings lose interest. As a rule the number of annual reports printed is too small to allow of sending a copy to each member of a board of health. There are various other expenses of such associations which need not be itemized. This cost, it is maintained, should be borne by the State and not by the members of the association. Most of these members serve without pay, and many of them have to bear their own expenses in attending the meetings. For the State to pay all the expenses of the meeting tends to increase the attendance. Without offering it as a proof of the position here taken, it may be stated as a fact that in Ohio, where this plan is followed, the attendance at the last two annual meetings of health officers has been not less than three hundred and fifty.

Another advantage claimed for the control of these associations by the State Board of Health is in the selection of a program. No one knows so well as the Secretary of the State Board of Health, the needs and short-comings of the health officer, and the subjects that should be discussed for their benefit.

Attendance. Every effort should be made to secure a large attendance. Newly-appointed health officers and members of boards of health should be specially urged to come. The quality of the proceedings may suffer somewhat, but it should be kept prominently in mind that the real object of such an association is the training of health officials for the wise enforcement of sanitary laws. An appeal should be made to the public authorities to send delegates from their boards of health to the meeting, and to pay their expenses. The advantages to a community of having a representative at these meetings should be set forth in an appropriate circular.

Program. The success of the meetings and the maintenance of the association will depend largely upon the character of the programs. It is no easy matter to arrange a successful program for such a gathering. It will be made up of a few men who, from study and long official experience, are well up in all sanitary matters of the day; of physicians familiar with all that bacteriology has given to sanitary medicine; and on the other hand a number, perhaps the majority, who are profoundly ignorant of many of the questions which should be discussed, but most anxious to learn their a, b, c, of sanitation, and especially *administrative* sanitation. They are charged with the weighty duty of protecting the public health by the enforcement of sanitary laws, and yet have everything to learn in setting about it. Topics must be provided which will also interest the old members and skilled sanitarians present. The latter, with a little manipulation, may be made teachers of those less well informed, a rôle not unattractive to most men at a public gathering. Those selected for this purpose must be sincerely anxious to teach and not merely desirous of displaying their own superior knowledge, or they may drive those most needing instruction out of the association.

A question box will be found to remove many difficulties. Delegates should be asked to formulate questions concerning matters which their board of health has not been able to properly manage, or bringing up local questions of special home interest. Some difficulties may be encountered in having these questions properly answered, and care should be taken by the President to have false or faulty answers corrected. A specified time should be set aside for the question box.

At all public meetings of this character the tendency is to provide too

many papers. This is specially to be deprecated at meetings of health officers where a general discussion is the most valuable part of the proceedings. On the other hand it is unwise to simply provide subjects for discussion without having persons selected in advance to write or speak upon them. When this is done the subject is usually very lightly skimmed over.

There must unavoidably be more or less repetition at the different meetings to provide instruction for the new members who come in from year to year; but the fundamental questions of sanitation should be presented in as many different lights as possible, so as not to be stale and uninteresting to those who attend regularly. The rapid growth of sanitary knowledge permits of something new being said each year, even on subjects of this character.

Delegates should be encouraged in taking notes of the essential points of the discussions, and in making a report of the meeting to their boards of health. A written report, which the local papers are usually glad to publish, will not only be of educational value, but will be helpful in convincing the people that it is wise to send delegates to such meetings. If the State Board of Health is to keep control of the association the members of the Board or its Secretary should not appear too often on the program. As a rule they will be better qualified to discuss many of the questions desirable to bring up, and the temptation to secure good papers will lead the program makers to call upon them frequently for assistance. It is well, however, that such honors should be well distributed among the health officers.

In most States it will be found, I think, that successful meetings cannot be held oftener than annually. Where the capital city is easily accessible there are advantages in holding the meetings there, and especially at a time when the Legislature is in session. We are all familiar with the many difficulties in securing sanitary legislation, even when the public benefit is self evident and the expense to the State little or nothing. An association of health officers, where local boards of health are well organized, can be of the greatest assistance in securing desired legislation. Care may be required to prevent a local matter being made the cause for a demand for legislation, undesirable if made general.

Local associations of health officers should be encouraged. Where boards of health are well organized the county forms a desirable unit. An important function of such a local association is to insure the enforcement of proper measures to control the spread of contagious diseases. It is a common cause for complaint by a city or village that they are endangered by the negligence of a neighboring town in caring for their cases of contagious diseases. School districts frequently overlap, so that children living within the jurisdiction of one sanitary authority attend school in another. A county association of health officers, with an executive committee to look after such matters, makes it possible for mutual assistance of great value to be rendered. Such an association keeps up an interest in boards of health and sanitary matters, and fosters a most desirable spirit of emulation in the enforcement of health laws and in keeping towns in a good sanitary condition. Many questions of a purely local character, which would burden a State meeting, may be considered with advantage at a meeting of the county association.

With an active association of health officers in each county, sending delegates each year to a State convention, the work of all directed and

correlated by the State Board of Health, the sanitary matters of a State could not fail to progress in the most satisfactory manner.

To recapitulate: There should be an association of health officers in every State, independent of its sanitary association. It is better that this should be controlled by the State Board of Health, the State bearing all expenses. A large representation should be sought for, and programs for an audience with varying degrees of sanitary culture should be provided. The proceedings should be published separately and widely distributed. County associations of health officers, dealing more particularly with local matters, and fostering and sustaining the State association, should be organized in every county.

Chairman Wells—State Work for the Restriction and Prevention of Diseases is the next subject upon the program. It is one of very great importance, and will be considered by Doctor John S. Fulton, Secretary of the Maryland State Board of Health, whom I take pleasure in introducing:—

STATE WORK FOR THE RESTRICTION AND PREVENTION OF DISEASES.

BY JOHN S. FULTON, M. D., SECRETARY STATE BOARD OF HEALTH, BALTIMORE, MD.

All of you must know the mingled feelings which accompany one to a first meeting with some distinguished person whom one has long desired to know. Ever since I was asked by the Michigan State Board of Health to take part in these exercises, I have been suffering that pleasant perturbation. At the first moment one's spirit leaps before him to speak the homage that he owes, at the next shrinks behind him lest the occasion be too great. And few occasions can be greater than those upon which men meet, as we do now, to review the successful campaign of a great State against death, disease, and pain among her citizens.

The growth of the science of hygiene has so far proceeded by similar steps in the same order which characterizes all social developments, and one may reasonably believe that its future history will follow the general formula of the older and more advanced evolutions. Necessarily progress is not in a right line nor with a straight front. Humanity, like the groping phagocyte, thrusts out apparently aimless pseudopodia, touching often nothing, sometimes a little thing, and rarely some great matter; but never failing to recognize, to grasp, and to drag the unthinking mass toward that which it needs.

Often enough great movements, though guided by definite purpose, reach results quite different from and of greater value than those sought. Such was the memorable Winter's Journey of John Howard, who desiring primarily that the jailer of Bedfordshire might be paid a salary instead of fees, begot an impulse that gathered strength from day to day, until British law abolished jail-fees, and initiated the sanitary reform of prisons and asylums. Then the voice of humane compassion began to prevail in British politics, and against even imperial will sounded the doom of colonial oppression, slave-trading and slave-holding, religious persecution, and a barbarous penal code. Then sanitary legislation upon grounds of reason and humanity became possible.

In times so ripening Jenner brought forth his imperishable thought, and in the history of vaccination for the next fifty years the future of sanitary legislation was broadly outlined for two centuries. Hitherto human health had been of political concern only so far as military and naval operations depended for success upon the effectiveness of human tools. The more or less rational conjectures of the medical teachers of that day offered no firm basis of fact upon which might be built legislation to protect the peaceful, home-keeping population. Here at length was a decisive conquest over a unit of disease, and toward the application, in express terms of law, of such a victory to the safety of the whole people fear and reason alike impelled. In respect of vaccination against small-pox, the principle is affirmed beyond controversy that the individual may be obliged, for the sake of the common welfare, to choose between two alternatives: either to acquire immunity at the cost of an infection produced by design, or else give up his personal liberty for a period after each exposure to small-pox. This is the farthest reaching precedent which has yet appeared in the history of State Medicine. Since civilized nations began to incorporate this scientific procedure into law, it has everywhere by all men been believed that the prevention of small-pox is of general no less than of local concern. If it be a right function of law to prevent small-pox, then law need only wait for available means to prevent other diseases. One article of the catholic creed of sanitation is that the health of the people is the charge of the State.

The force of the older principle, that the health of the citizens is the care of the City, is not in this declaration diminished but augmented, and with the growth of local sanitary government, the functions of central sanitary administration must broaden and deepen. A republican principle so well settled as to need no proclamation is the right to local self-government, and wherever this right is most loudly asserted in respect of sanitary matters, there will usually coincide the greatest need with the least exercise of self-government. Since the welfare of the State can only be the resultant of the welfare of its component units, common sense will insist that the local administration of sanitary law be referred to some established form. Such has been the history of all law, and nothing different can be expected of sanitary law. It is doubtful if there is yet anywhere a board of health which nearly approaches perfection, or if there will be such an example until the sanitary government of states shall be co-ordinated by national sanitary law, incarnated in a National Bureau of Health.

Neither in science nor in politics do we find all things ready for the organization and equipment of such a board of health as could make serviceable all the ripe fruits of modern medicine. Nowhere has sanitary legislation grown up symmetrically. Legislatures have put into law, without reference to previously constituted authority, the sanitary conceits of all sorts of reformers, moral, religious, philanthropic, educational, commercial, industrial. The results of administration, though in many instances disappointing, have been on the whole so profitable that one must in spite of its redundancy rejoice in such extraordinary growth, as promising that exact knowledge concerning the causes and prevention of disease will not advance much faster than law will follow.

As a preliminary step toward the plane upon which the sanitary affairs of a state can be best administered, one would suggest the appointment of a commission to revise and reembody in a workable and understand-

able code those laws which in any state have been found useful in the protection of human health. Such a commission would engage first rate legal talent, experts in the administration of sanitary law, in the statistics, and in the chemistry and biology of hygiene, engineers having special training in sanitary works, men of wide experience and ripe judgment in the care of the dependent and delinquent classes, and in the education of children. Happy the state which can associate in one undertaking seven, or nine, citizens possessing such qualifications. I doubt if in any state a committee of recognized authority upon these subjects could be assembled from the ranks of one political party. Such men would in their appointed work constantly confront questions of state-craft, and the more clearly they recognized that public health is an important object of practical politics, the better would they build against the vicissitudes of party, and the more scrupulously would they preserve the treasures new and old accumulated in the long history of hygiene. Our commission would have much in hand besides the organization of a State board of health, but they would have no more important work, nor any that we can consider on the present occasion.

Looking at the numerous boards of health, state and local, one must be impressed that the modern idea of a central sanitary authority is immeasurably better than the older conception of a local sanitary authority, in that it is designed to be, and usually is exempt from the depredations of party traffic. It is a propitious sign that in these alleged decadent days the science of state medicine should have this immunity, for upon this vital quality depends the strength of the whole structure. The weakness of local boards in this regard sufficiently emphasizes without further argument the need and value of a State board of health.

The first need of a State board of health is a code of sanitary laws, covering all workable ground without gaps and capable of being amplified without overlapping. Such a code will provide before all things else, the information which alone can give to the efforts of the board definite direction and measurable effect. It is not necessary here to speak at length of the value of complete systematic registration of vital statistics. The general economic worth of such registration was recognized long before its special utility was discovered by sanitarians. Indeed modern state medicine may be said to be the unpremeditated as it is by far the richest result of the General Registration Act of 1836; and the foundations of sanitary legislation might not yet have been securely laid if the administration of that act had been committed to any other Englishman than the consummate master of statistical methods, Edwin Chadwick. The function of vital statistics which is of the highest use to the sanitarian is to furnish true, full, and fresh information concerning the causes of death. As to the cause of death only a physician can testify with authority, and he will speak most authoritatively if his record be made at the time and place of death. There is but one way to insure immediate registration, and that is to forbid any disposition of a dead body until a proper record is returned. The burial permit is the key to prompt registration, and without it no vital statistics law can be economically operated.

An important detail, omitted from American and English practice, is the verification of deaths. The physician too often accepts the statement of an undertaker or friend that an expected death has occurred, and certifies accordingly. He makes no visit to substantiate the report,

nor inquires through how many individuals the rumor has come to him, or whether his informant ever saw the patient alive or dead. This point has perhaps no bearing upon the value of statistics, but in other relations it will be found rather a serious omission.

Since a vital statistics law returns its greatest profit to the state in information as to causes of death, it is desirable that so far as possible all the details of its administration should be in the hands of medical officers. That the mortality returns are often of great value and completeness when compiled by non-medical men does not argue against this general principle. Rather does it show that intelligent laymen may acquire much medical knowledge in the practice of mortality registration, and suggests that if such men had been trained first in medicine they would have been yet better statisticians.

A chief need of registration officers has always been a good classification of deaths for statistical purposes. The science of pathology has now so far advanced that a thoroughly good classification, capable of universal use, is possible, but it is not likely that any State board of health will set about making one. If statistics are to be useful in the broadest way, State boards of health must come to a general agreement among themselves on this point of classification. At present the need of uniformity does not seem to be very widely felt.

What a curious reflection it is that we have so long and carefully kept our irretrievable account against relentless Death, while against Disease, the mitigable agent of Death, we make only occasional entries. The idea of sickness statistics has never been forcibly impressed upon any modern legislature, though it has long been clear to sanitarians that statistics of sickness are of more immediate practical utility than returns of death. The most convincing political argument developed by Edwin Chadwick in his report of 1838 was that the cost of sickness was the principal item in the burdensome poor rates. He did not argue concerning the cost of death. It was then, as it is now, cheaper to bury a dead man than to support a sick one. The average assembly-man, so far from being convinced, smiles at the enthusiasm of the sanitarian who attempts to impress upon him the economic loss involved in disabling sickness; but the same assembly-man when injured through the neglect of a transportation company is sure to assess his disability, whether temporary or permanent, at a good round sum, and the average juror usually agrees with him. If from the value of a hand or an eye so determined, one should try to calculate the cost of total permanent disability from preventable disease, court and jury would spurn the reasoning. The blindness of municipal and state legislatures to these considerations illustrates how easily a tax may be concealed if it be indirect. In the army and navy where the cost of sickness falls directly on the organization, statistics of sickness are always available.

Happily it has been shown in one state that statistics of sickness can be systematically gathered without the aid of law. It is the unique distinction of the Michigan State Board of Health to possess continuous records of prevalent sickness for more than twenty years, and to have established the surpassing value of such statistics. For the present such a possession must, I fear, remain the envy of other State boards of health. One finds it hard to believe that Michigan medical men excel the physicians of other states in mental stature, and one must attribute the sustained success of this system not more to the intelligence and

fidelity of the individual contributors than to the singular executive skill and personal influence which has made Lansing the focus of all these impulses. If I were a Michigan physician I should count it somewhat of a distinction to be a local contributor to these reports, for the combined observations of your one hundred or so observers are more exact in their indications than those of a thousand physicians returning certificates of death.

Not long ago I had occasion to make from the experience of thirteen boards of health a composite curve representing the annual diphtheria mortality by months. One hundred and twenty-five thousand death certificates entered into the composite, and of the thirteen separate curves none resembled the composite so nearly as a Michigan curve from the sickness reports. I am inclined to believe that the normal seasonal rise and fall of diphtheria would be as well shown from the weekly sickness reports to the Michigan board of health as from the combined mortality returns of the country.

Michigan experience affirms it to be as true in practice as it is in theory that one hundred representative physicians in active practice will each see whatever sickness is present in each locality, and will be able to report year in and year out a fixed proportion of all the disease in the state. Unlike mortality statistics, statistics of sickness do not require to be complete. Their use is that of a sample for analysis. They furnish data for reasoning, not arithmetical results. It is difficult for a man who is sensible of his own fallibility to realize that his observations with those of a hundred other equally fallible men will yield results of unvarying accuracy, but it is so. "If," says Doctor Baker, "the weekly reports of a sufficient number of competent observers, well distributed over a given territory, produce results which are quite consistent from week to week, from month to month, and from year to year, such statistics must be accepted under the law of probabilities as sound data."

A recent step in preventive medicine promises to bring reports of sickness within easier reach of some of us. The establishment of public bacteriological laboratories, rendering free assistance to physicians in the diagnosis of infectious diseases, creates a new bond of mutual interest between sanitarians and practising physicians. Such a bond has hitherto been lacking, and public health practitioners should let no part of so important an advantage slip from them. In Maryland we hope to keep the physicians reminded of their obligations to the state by asking at the beginning of every application for bacteriological diagnosis, "Are you up to date with your reports of births, deaths, and infectious diseases?"

The short history of state and municipal biological laboratories has abundantly justified their existence. They have produced a copious literature which is of current use among clinicians and teachers, and have developed an army of workers who exert a strong influence on the medical thought of the day. Aid to private citizens and to medical men, valuable though it is, makes but one item to the credit of a public bacteriological laboratory. The larger profits are in the device and control of preventive measures, and in the habitual use of timely information, of accumulated records, of repeated observations and of opportunities for experimental work. The criticism which has fallen upon some of the laboratories, if it be just, convicts them of nothing more serious than

exuberant activity. No one complains that they have done less than was expected of them.

Substantial advance in the prevention of disease can only be made upon practical application of the truths of pathology. The activity and the productiveness of this branch of medical science in the last twenty years exceeds anything that the scientific world has ever witnessed, and the field promises yet richer fruit. Out of the harvest already gathered much has been profitably applied to prevention, and more is ready for practical application as soon as political common-sense shall apprehend and approve it. We dare not hope that any state or nation will proportion its steps to the strides of this science, but it is a hopeful sign for us all that the American people, who waste little courtesy upon things not obviously practical, have recognized the rich promise of biological research and have engaged it in the public service.

State and local boards of health must both be eternally vigilant of all common carriers of infection, and the State board of health, as having the wider horizon, should be entrusted with the primary and paramount authority. The chief common carrier of disease is water. In these days when the private well is rapidly being displaced by the pipes of the Company, the power of the water-supply for good or evil is greatly augmented. The territorial rights of local boards cannot be made broad enough to secure adequate supervision and control of such large sources as are placed in tribute. Any community may easily obtain what seems to be a clear title to the use of a stream or lake, but the conflicting natural rights of other communities and of individuals are soon found not to have been alienated even by Act of Assembly. Each and every party to such a contention stands upon his rights, though none can obtain his rights until all are obliged by some commonly respected authority to do their several duties. The example of those states which have vested the control of inland waters in their boards of health deserves to be generally followed. Commercial companies even when they have used right judgment and skill in their first provisions, are less scrupulous about supplementary sources when extending their service, and are apt, after ever so good a start, to become indifferent to most considerations aside from profit. Municipal water boards are most heedful of the voters and taxpayers, who either drink what is delivered without grumbling, or else demand that the cost of improvements shall fall on land owners outside of the city. A State board of health, having in charge all the possibly conflicting interests, will determine whether the desired sources may properly be laid under tribute; whether the water is of good quality, or may be purified and kept pure; whether its volume is sufficient; will examine the plans for collection, storage, purification, and distribution; will secure to the users of the water adequate rights of inspection and nuisance removal; and will see that no natural or acquired rights, either within or without the city, are exercised beyond their reasonable and proper use.

Closely related to water supply and equally needing state supervision is the disposal of waste. Sanitary progress should of course be symmetrical, but it is the peculiar habit of communities to consider but one problem at a time, and having taken one step to be content therewith until growing disappointment or imminent disaster drives them to another. Where hygienic education has proceeded as it should, good methods of disposal of waste will have been understood and practiced long

before the need of a general water-supply is felt. That all communities, even the smallest, shall be instructed in the care of the soil should be an especial concern of every State board of health. The introduction of a common-water supply, however excellent, into an unsewered, unscavenged town is not likely to be an unalloyed blessing. A filthy soil will be all the filthier after the so-called modern conveniences begin to flood the town with diluted wastes. Private wells will become degraded to disgusting uses, and the area which before had a malodorous eruption on its surface, will become honeycombed with putrefaction vats. Good water supply and sewage disposal are twin necessities. Neither may properly be considered apart from the other. Judicious intervention in such local affairs not only saves local authorities from errors against their own citizens, but also prevents injury to other communities. The same scrutiny which a well ordered town gives to the sanitary proposals of individuals, should be exercised by a State board of health over the sanitary works of cities and corporations. No community, large or small, should be permitted to use any natural stream or lake, or to impound any water, or to lay any sewer, or acquire a right to deposit night-soil or garbage anywhere without its own limits, until full plans and details are submitted to and approved by some board of general authority, who shall also examine all the rights, titles, interests, and objections of all parties affected or likely to be affected by the construction or operation of such works.

The manufacture and production of food and drink, and the health of domestic animals, as having important influence upon human health and comfort, should be regulated by a law of general application throughout the State.

All the matters which we have so far considered relate to general sanitation, the main defensive works against disease. They are certainly a very important part of the work of a State board of health, but a central board which did not make any aggressive efforts against specific diseases would fall far short of its legitimate purpose. The local board must in every instance first engage a local outbreak of communicable disease, but the State board of health can always give counsel and aid, and should possess resources of its own equal to any emergency that may arise. Supposing the local officer to be equipped and competent to manage a large outbreak, the State board can make his operations proceed more smoothly by instructing the people concerning the disease then present. The timely distribution of well prepared circular literature, teaching people only what they need to know on a present occasion, has long been practiced by the Michigan Board of Health, and must have saved many a local health officer from the stupid or sulky obstruction, which so often hampers his efforts.

But local officers are not always equal to all probable exigencies. Subject to frequent change at the will of party or faction, local boards cannot maintain constant efficiency. In the presence of grave infectious disease the State board of health should always exercise its powers to the precise extent necessary to compensate the deficiencies of the local board. In any crisis utterly beyond the control of local authorities, the State board should seize the situation as tactfully as they can, but peremptorily if they must. An epidemic is more than a local calamity. It hazards the safety of the whole commonwealth. It is a far more dangerous thing than an armed and riotous mob, and must be dealt with as summarily.

Wherever any grave infection reaches the proportions of an epidemic, the State board of health should co-operate on the spot with even the most competent local board, and each should clearly understand and discharge its own functions. To the local board properly belongs the actual domiciliary work in the front. The responsibility behind the fighting line should be borne by the State board. Particularly should the State Board secure to the local board the credit and confidence which the community owes. In no other way can the necessary activities go on without expensive disturbance of the ordinary life of the place. As to all that threatens public health outside the local sanitary jurisdiction, the State board should exercise its paramount authority. These matters will relate chiefly to the disposal of dead bodies, and to the movements of persons and things believed or suspected to be capable of carrying infection. Immediate circumstantial information should be furnished to other local boards concerning every suspicious person or thing that may be moving out of the infected area.

The running history of every epidemic and of every outbreak, large or small, should be preserved. The management of infectious disease is the clinical work of State medicine, and without a case book one's experience can never be large or comprehensive. The practice of the Michigan Board of Health, opening as it does an account with every outbreak, and continuing item by item till the incident is closed, has amassed a collection of histories that any of us may honorably covet.

The public, including the doctors, have not yet learned what an epidemic is, and local health boards are usually loth to use the term within their sanitary jurisdictions. This reluctance doubtless grows more out of the sensitiveness of large business communities, than out of the professional sensitiveness of local officers. In current use, epidemic means simply the prevalence of unusual or dangerous disease. Fifty cases of rabies would in Detroit seem an epidemic, and your newspapers would reverberate with the horror; but who ever heard of an epidemic of tuberculosis anywhere? If the 100 deaths from typhoid fever which occur here in a year should all happen in three months, you would refer to the 1,500 or so cases as an outbreak. If they all should fall in a month, you would have to admit the existence of an epidemic. The people need to know that in every city or state whose typhoid rate is year after year above two per thousand, typhoid fever is annually epidemic. Typhoid fever is as much the sanitary shame of America as yellow fever is the opprobium of the West Indies, or leprosy of Hawaii. I suspect we shall remove both these latter motes from our neighbor's eyes before we get the beam out of our own.

We have been hearing much recently about the health of our soldiers at the military camps in our own country, and in Cuba. At the home camps we have troops relatively immune to typhoid fever; at the front troops generally susceptible to yellow fever. Sanitary discipline is perhaps not better at the front than at home. Against typhoid fever we possess preventive measures of positive and proven effectiveness; against yellow fever our methods are yet on trial. The sanitary history of the war now happily closing will furnish us some valuable lessons. If as we may anticipate, the prevalence and the fatality of yellow fever among the troops in Cuba should not greatly exceed that of typhoid at Tampa, it should teach us that our own familiar typhoid fever is to us a more formidable enemy than yellow fever can ever be. I doubt, however, if

sanitarians will be able by one or a hundred modern instances to impress this lesson deeply upon the popular mind. Rather will the average citizen perversely draw the single conclusion that yellow fever in Cuba and typhoid fever in the next block are equally paltry public questions.

But the barriers of popular misapprehension are not immovable, and it is the very highest function of a State board of health to remove them. This is a labor demanding infinite patience and tact, and those of us who do not possess these great virtues often wish that we might try upon our refractory pupils the educational effect of severely punitive laws. It is fortunate that legislatures will not permit us to employ these strenuous methods. The education of the people must proceed slowly but it may be pushed forward steadily and somewhat systematically. Many State boards publish sanitary bulletins which are of some educational value, but it is a fair criticism upon all such publications that they do not meet nor do they create any considerable popular interest. Those who read them must possess a tolerably advanced education in hygiene.

In our medical schools the teaching of hygiene is feeble and perfunctory, having little or no weight in examination for the degree, so that even the medical men in this country have, as a class, little influence or authority upon the subject. In England special courses leading to the degree of Doctor of Sanitary Science have been created, and hygiene has proper rank among the subjects of final examination for the degrees in medicine and surgery. To bring about a similar advance in American medical education is a worthy enterprise for State boards of health.

Hygiene as taught in the public schools is concerned exclusively with personal health, and propagates chiefly the somewhat contracted views of certain moral reformers. It is to be hoped that State boards of health will some day create a demand for far better instruction of youth in the principles of hygiene than boards of education now provide. The Michigan Board of Health has recently been successfully laboring to this end, both at home and abroad. The reception accorded to the paper of Professor Delos Fall at the National Educational Association would seem to promise that other states will not allow Michigan a very long start in legislation on this subject. The Michigan Teachers' Sanitary Bulletin has also lately appeared, and as the way for it was well prepared in the Act of 1895 concerning instruction in hygiene in the public schools, the publication has entered upon a career of growing influence.

The sanitary convention or association is of high influence in this work. The conference of health officers is of primarily technical interest, and its effect on public sentiment cannot be direct, or widespread.

The Sanitary Convention, as managed in Michigan, has the same strong points that we have noted in their distribution of popular literature on infectious disease. They are only held in response to local invitation, some especial need of such a convention being always then and there present. They are not emergency or calamity meetings; still less are they bon-bon parties given by ambitious towns. They are serious public assemblies to discuss some timely topic. The locality is always required to contribute its full share to the program, and to arouse in advance as much popular interest as possible. The influence of each of these conventions upon the community in which it is held must be lasting, and ought, it seems to me, to be lively enough to bring about the formation of local sanitary associations.

Finally it must be the study of every State board of health to establish mutually-helpful relations with all forces operating toward the safety and health of the people, and there are no such influences, individual or corporate, unable to make a fair exchange of benefits. As its relations with local boards will be most immediate and constant, I may be pardoned another word on that subject. The central sanitary authority must from the beginning assume some reasonable standard of efficiency for each locality, and must advance that standard from year to year. It may not at once demand that everywhere preventable disease shall be forthwith prevented; though that is the ultimate test of success. But it must require that all the means available in each locality shall be used to that end, and it must continually point out and supply means. Wherever local authorities are progressive, though in practice ever so little in the lead of popular will, there cordial approval can be given without condescension, and co-operation without officiousness. No local board will be so excellent that it may be neglected, and if any desires to be neglected, it must be either because the State board of health is inclined to unwisely act or dictate in local affairs, or because the local authorities wish to give the people the shadow instead of the substance of sanitary government. In no department of government is the appearance more easily substituted for the fact, and it must be remembered that sanitary misrule is most injurious at those levels of society where the power of individual self-defense is feeblest. It is for this reason mainly that I believe in the right use of power of intervention by a central board of health. The times are not yet ripe for the better remedy which will come when courts and legislatures shall affirm the legal accountability of local authorities for neglect or malpractice. That justice will in the future be accorded to the injured citizen, but meantime there is no check upon municipal sanitary crime unless there be appeal to some central sanitary authority clothed with power of intervention.

It will be observed that State boards of health as I have described them are executive as well as advisory. In this respect they would seem to differ from the excellent example whose successful career we are here to celebrate. The difference is, however, more apparent than real. Any one who reads the reports and other publications of the State Board of Health of Michigan, (and I advise every one who does not read them to mend his ways), will see that however much it may desire to be and to remain a purely advisory board, it has done much clinical as well as consultation and laboratory work, and has done it all extremely well. When popular education and sanitary law have so far advanced that every community will appreciate and provide for all its own sanitary needs, and will live cleanly with equal respect both to itself and its neighbors, then all State boards of health will be busy enough in advisory work; and our chemists, engineers, biologists, and statisticians will be sufficiently occupied in keeping us prepared for a higher class of consultations. We all hope to arrive at that consummation sooner or later, and all of us admit with hearty congratulations that about the speediest and most enduring of our pacemakers is here in Michigan.

Chairman Wells—Dr. Ernest Wende, Health Commissioner of Buffalo, enjoys an enviable reputation for the systematic, thorough and effective work he has done in that City for the restriction of diseases. You will doubtless receive the benefit of his experience in this field in the paper on "Municipal Restriction of Diseases", by Doctor Wende, whom I now introduce to you:—

MUNICIPAL RESTRICTION OF DISEASES.

BY ERNEST WENDE, M. D., HEALTH COMMISSIONER, BUFFALO, N. Y.

It is more than eighteen hundred years ago, that there was a set of men who "thought they ought to be heard for their much speaking."

As they have propagated exceedingly since that time, and as I observe that they flourish just now to a surprising extent, everywhere, I will do my best to avoid adding to that prolific race.

You will remember in Paul Clifford that that very sagacious person, Augustus Tomlinson, said, "Life is short and why should speeches be long?"

An aphorism so sensible under all circumstances, and particularly in the circumstance in which I am placed, I shall practically adopt on the present occasion.

Therefore, no time need be occupied in rehearsing before this audience the necessity of municipal action against contagious diseases and other adjunct factors that imperil the well-being of the community.

Such diseases and factors are of vital concern to every public body, to every individual and to every household as a household, and in proportion as it is appreciated so in proportion an enlightened public demands for itself as high a degree of protection as may be attained, without contesting its humane significance and civilizing influence.

If contagious diseases are preventable, why do they continue to exist? Why not prevented? Why not diminished with the progress of sanitary science and civilization? In reply, largely because of the apathy, ignorance and unconsciousness on the part of the public of what may befall them, and because of the indifference, mismanagement and conflicting interests on the part of the local health authorities in combatting infection.

Until the laity better appreciate the benefits resulting from a willing and intelligent obedience to Nature's laws of how to live and avoid disease, until they recognize the fact that without their assistance, the efforts of the sanitarian to control contagion and to blot out sickness, sorrow and suffering, but little radical improvement can be brought about.

Then, what is necessary to consummate such an end?

1. The education of the masses in all that pertains to public hygiene, to enlist their co-operation against carelessness and disregard in the application of laws or principles for the preservation of health in whatever way they may be employed.

2. Municipal equipment and organization to carry out modern sanitation, to be of such intelligence and activity as to make it a blessing to the people and creditable to a progressive city.

3. Strict ordinances, rules and regulations, the execution of which should be arbitrary, prompt and impartial.

4. Laws obtained from the Legislature of the State giving plenary powers to the health authorities in matters of municipal sanitation.

What should the ordinances embody?

1. A complete classification of the recognized infectious diseases, with a specific definition of the same, for legal guidance and vindication of public rights.

2. Mandatory notification on the part of the physician or householder, through the public telephone system, immediately upon discovery of any contagious malady specified by law, for the action of the municipal health officer.

3. The placarding of infected houses as signals of danger, for public warning.

4. Isolation at home, and prohibition from school attendance, from exposure in public places, or in any way aid in spreading contagion, also the rigid enforcement of quarantine when indicated, in order to secure the full benefit of isolation.

5. The proper removal and reception of infected persons, when necessary, to a suitable hospital.

6. Compulsory vaccination and revaccination for self-protection and for the benefit of others. The failure to provide and enforce this safeguard against small-pox, to allow its work of death and disfigurement unimpeded is maliciously wicked, and criminally neglectful.

7. The sanitary disposition of the dead from infectious and pestilential diseases.

8. Thorough cleansing and disinfection of the infected house and its contents under municipal direction, and the destruction of bedding, clothing, and other articles exposed to infection, also the prohibition of throwing any infectious material or rubbish into any receptacle for the deposit of refuse without previous disinfection.

9. Supervision over the erection of all tenement and lodging houses, to insure a standard amount of light, ventilation, plumbing, cubic air space and other hygienic features, and by systematic inspection to so maintain them.

10. School-house inspection by a medical inspector, with power to regulate and advise concerning school-room sanitation, plumbing, sanitary propositions, personal hygiene, exercise and physical culture, contagious diseases and the like.

11. The creation of small parks in connection with public schools, thus affording suitable school environment, ample play-ground, breathing spaces in the crowded districts, and a corresponding beneficial influence upon the developmental period of youth and childhood.

12. Thorough inspection of food products, of dairies and cows, prohibition of the sale of infected milk.

13. The establishment of free public baths, to be located in the manufacturing centers, and in sections where the poor predominate.

Frequent baths are invigorating tonics, which restrict disease, promote health, morality and self-respect.

14. An enactment to furnish labor for the unemployed poor, "who, through neglect, are allowed to become sick, a public charge and hence a double expense;" as industry gives force and vigor to life, conduces health and contentment, which means municipal economy.

15. The establishing of a municipal bacteriological laboratory in furnishing available assistance in the diagnosis of diphtheria, tuberculosis and typhoid fever, and in assisting us to form a rational idea respecting disinfection, isolation and the prevention and cure of diseases generally.

16. A systematic dissemination of detailed directions and hygienic rules for the special needs of unsanitary features and conditions of any kind or nature, and their application judiciously insisted upon.

17. Rigid enforcement of the penalties for violation of all sanitary laws, and especially those relating to infectious diseases and their control.

18. Regulations and rules defining the relation of the medical practitioner to the medical officer of health, regarding their respective duties to infectious diseases.

19. Qualifications of the highest grade in medical officers of health who should possess technical education, tact, firmness and fearlessness, and who should be selected on account of fitness. The municipality should not be exposed to an unnecessary risk by politics. It should override it.

20. Arrangements for keeping the Health Department open on every day in the year, and at all hours—day and night—to receive reports of infectious diseases so that no time may be lost in taking such immediate action as the emergency demands.

The scope of this paper precludes the consideration of each proposition in detail. However, as a type for the purpose of elucidation and demonstrating the phases in the development of measures adopted for the restriction of diseases in Buffalo, the three maladies—

Diphtheria, as representing the contagious and infectious;

Tuberculosis, combining contagion with heredity;

Infantile diarrhœa, as illustrating the dietetic and hygienic,—will best serve the object.

Diphtheria. The nature of diphtheria, its possibilities and long recognition has attracted the efforts of the sanitarian and physician, so that today the most glorious triumphs in the reduction of mortality have been achieved by the employment of preventive measures.

Thus, based upon our present sanitary knowledge, we combat it upon the subjoined principles.

a. That it is a contagious, virulent malady, capable of enormous injury and dependent upon a specific organism resident in the throat or other locality attacked.

b. That under certain procedures, if possible to carry forth to a successful end, it could practically be stamped out.

The group of acute infectious diseases of which diphtheria is a representative, demands and should receive the most aggressive action.

While ever present, its limitations have step by step progressively, been circumscribed, and this has been and can be accomplished in communities upon the following lines:

First and most important, the prompt recognition of the true nature of the malady.

No affection has been the subject of more difference of opinion in diagnosis by the rank and file of practitioners. In many cases, pending the correct diagnosis of the disease, great havoc has been wrought, while on the contrary, the erroneous assumption of its existence has entailed anxiety, economic damage, and worse, either a distrust of correct diagnosis or apathy towards its possibilities.

With the possibilities of accurate diagnosis by bacteriological tests, it is now incumbent upon all properly protected municipalities to have

in operation and quickly available, the resources of an effective laboratory, that, without delay, the profession can confirm or dismiss cases in doubt. The value of this method is now no longer questioned by the most extreme practitioner, and to a progressively enlightened public, interested in sanitary matters, acquiescense in it is accomplished, if not demanded by the public at large.

The system in vogue in Buffalo represents what is believed to be as practical and stringent as circumstances will permit. It is obligatory upon physicians to report to the Department of Health (at all times) by telephone, which is free of expense to them, each case of diphtheria immediately upon discovery as they come under their notice.

At least, 24 hours is saved by the telephone, and notification to the public by placarding the house is accomplished just so much sooner than reporting to the department by mail; thus possibility of further spread of the disease is materially reduced.

If doubt as to the nature of the malady exists the physician has at his command, in all sections of the city, the resources of the laboratory and a report within 24 hours. This procedure is made more available by the co-operation of the Police Department.

In each Police Station of the city culture tubes and swabs, compactly put up in a small box with printed directions for inoculating, so simple that a novice is capable of following them, can be had by any physician.

The culture outfit contains a blank to be filled out by the physician, furnishing the laboratory with name of patient, address, duration of disease, location of membrane and such other information as the department records require for a full knowledge of the case.

Through this same channel the culture outfits are returned to the Health Department, passed upon and within 24 hours or less, the medical man is furnished with a diagnosis of his case and the house placarded if necessary, without further cognizance on his part. Through this system of co-operation between the Police and Health Departments the service is kept entirely under municipal control, and rapidity and freedom from error made definite.

The placard is maintained until a bacteriological examination demonstrates the absence of the diphtheria bacilli.

The placarding of the house for the public information is immediately followed by a visit from a Sanitary Inspector who institutes such other sanitary measures as seem indicated. A detailed report upon the premises is presented by the Inspector, including all such features as defective plumbing, unhygienic surroundings, possible source of the infection, together with such recommendations as, in his judgment, the conditions demand; the Department immediately ordering rectification of all sanitary defects. Further aggressive action is instituted following the Inspector's report, notably, notification to school principals of all cases occurring in their districts and thus interdicting school attendance by pupils from quarantined houses; and notification to public libraries that the circulation of infected books may be prevented.

The source of milk is also noted and the possibility of this medium as the infectious channel considered. On account of the importance of the milk supply as a possible source of infection, a special ledger is preserved in the Department office detailing each milk dealer's route, families supplied, source from which milk is obtained and such other data as

may be necessary. This ledger is posted daily and thus the healthfulness of the families supplied by each individual dealer is constantly watched.

As soon as it appears that on the route of any milk-dealer infectious disease exists, an immediate investigation is made into every detail of his business, source of supply and conditions existing there; when, if justification appears to exist or even a doubt, his route is suspended until it can be made absolute that his is not the source of danger.

Furthermore, the dealers are not allowed to leave at, or remove from an infected household any milk receptacle, neither can a milk-dealer fill a milk bottle on his wagon.

The feature of milk-dealers' routes and contagious disease supervision cannot be too strongly commended.

It has demonstrated its importance several times in Buffalo in ascertaining and determining that to be the source of infection, and made possible the arrest of several rapidly spreading epidemics, notably of scarlet fever and typhoid.

In addition to the above, each placarded household is furnished with a circular printed in their own language, setting forth the nature of the disease in question, laws pertaining to quarantine and instructions for the care of the sick, disinfection of excreta, and detailed instructions to prevent further spread of the disease.

The feature of municipal placarding is the one mostly complained of on the part of the infected household and one which in many cases determines dishonesty on the part of the attending physician and is a frequent source of much trouble to those concerned. The external evidence of internal infection is thoroughly appreciated by those for whom benefit is intended, and almost as thoroughly objected to by those within.

More particularly is this feature in evidence when placarding interferes with business as when it occurs in connection with a store, or where other children in a household have to suspend their school life and practically be quarantined within. These are cogent reasons to the average family and when the moral sense of the physician is elastic and the interests of the household itself made supreme, concealment is attempted, often successfully, and the objects of sanitation defeated.

So much injury or loss to small stores has occurred, so much resentment at interruption of routine household work has been occasioned, that in certain sections of the city it was, at one time, equivalent to loss of practice for a medical man to diagnose and announce diphtheria.

Thus unfortunate conflict between interest and a sense of duty has been in evidence in house placarding for all contagious diseases and it is to be regretted that there appears to be no feasible way, at present, to exact official action in interdicting it.

In many cases of this character, the Health Department has been able to detect and punish in court such violations of law, through complaint or information furnished by an interested neighborhood.

This is not, however, to be construed as evidence of a high sense of duty, but rather as an illustration of the dependence upon the question of "Whose ox is being gored."

The features of bacteriological laboratory assistance, house placarding, expert sanitary house inspections and investigations, surveillance of milk routes and supplies, are of supreme importance and efficiency.

Each has its difficulties, but notwithstanding, they are insisted upon and enforced. To the efficiency of enforcement the limitations of the contagious diseases have been narrowed and severe epidemic visitations made a matter of history.

If to the factors enumerated could be added a system of compulsory official and municipal disinfection, it would almost appear that extermination of acute contagious diseases was in sight.

It is remarkable that municipal equipment for municipal disinfection, the most cogent of measures, should yet be subsidiary.

To disinfect, as now practiced in most communities, is a matter of department recognition carried out under the directions of the physician, with such implied efficiency as only the personal factor admits.

Disinfection, to be efficient, should be obligatory, arbitrary, made by those specially trained and by up-to-date equipments and applied with intimate thoroughness of knowledge regarding the various agents and their particular use and indications in individual cases.

The Department of Health should supervise the disinfection, see that contagion is annihilated and a public record maintained of such inspection and disinfection.

From such record, data should be available for the real estate interests, for the public and for house hunters.

What is more pitiable, and yes, more preventable, than the possibility of a family of little ones moving into a dwelling, perchance to be the victims of a pestilential infection.

Medical men are but too familiar with instances of this character and its results.

We have to consider the most formidable foe of the human race—tuberculosis—and one presenting propositions as difficult as important.

A notable feature pertaining to it, and beyond question, is its prevalence amongst lower animals. No disease equals its fatality nor attacks so many of them. Domestic animals only vary in susceptibility and those escaping under natural conditions promptly respond and succumb when innoculated. Its communicability and identity in man and the lower animals, its enormous mortality and the methods of dissemination, with equally accurate knowledge as to the methods which could restrict its prevalence, direct criticism to what is largely left undone by the State whose attitude in general is one of negligence or indifference.

The cause of this apathy need not detain us, it is explainable by lack of knowledge, experience, conflicting interest, sentiment and the like. In some sections, partial efforts have been and are made, yet the essential of success—uniform and systematic procedure—is lacking, and until this is obtained, without considering the question of the ways and means, compensation, etc., the State, which should be, if anything, prodigal in its expenditure for life and health, should maintain the following:

1. Quarantine against the introduction of tubercular cattle. This should be as rigid as that against any pestilential disease in man.

Security against foreign invasion circumscribes the conditions and concentrates aggressive action at home.

2. Milk herds and dairy interests should be under strict surveillance and preferably under the license system. No dairyman should be permitted to engage in supplying milk without first obtaining a State license to do so, which should only be issued after inspection. Such inspection

should include physical examination of the herds and the use of tuberculine test, together with consideration of all sanitary features bearing upon the animals and protection of milk.

Buildings should be adapted to the business, the employés free from disease; care of animals, food, water, details of cleanliness, transportation features, and in fact all procedures, should be scrutinized and maintained up to a high standard of sanatory excellence.

3. No beast should be used for food without satisfactory evidence of its being free from disease. In cities, the public abbatoir system should prevail. The advantages of this are well known.

It directs and concentrates the slaughter industry, permits inspection of all animals before killing and of the carcass and viscera after, and practically can be made to preclude the possibility of the consumption of unfit meat.

Of the transmission of tuberculosis by meat or the degree to which the flesh of tubercular cattle is fit for use there is some honest difference of opinion. There can be no question, however, that when the infection is more or less general and the animal in poor condition that such meat should be interdicted.

Literature pertaining to sanatory matters and particularly in the premises under consideration, should be freely extended until those to whom directed can know that sanatory excellence is to their highest advantage and interest.

With exclusion from without and extermination within, with a standard of sanatory excellence, mandatory, and all that it implies, one prolific source of infection is within reach of State action.

In the absence of such a protection as outlined and of jurisdiction, the Department of Health of Buffalo, has adopted, under my direction, a scrutiny, incomplete as it may be, which briefly is as follows:

A record is kept of the conditions that prevail at each dairy supplying the city with milk. This information is obtained solely by inquiry but has been found generally reliable.

It includes data of the size, health, tuberculine examination of the herds, character of the water, food, health of employés, methods of milking, cooling, cleansing, transportation, in fact, all factors bearing upon the purity and protection of the milk.

Additionally, circulars are caused to be sent, bearing upon the possibilities, etc., of the business.

When conditions at the dairy appear prejudicial to the public health, from any cause, investigation is made and correction requested.

In the absence of authority beyond the municipal limits, when action for any cause appears necessary for unsanatory reasons, for failure to comply with the Department's request, the product of such dairy is interdicted at the city line and the dealer to whom consigned notified, until such time as the offense is removed.

With this mode of procedure and its results, any city can exercise a large influence upon dairies supplying it, exclude milk from known tubercular herds, and obtain sanatory protection beyond its own field of authority.

With brief reference to this recognized source of tubercular infection and the outline of action towards its destruction, the more difficult and

the more important question of how to deal with the tubercular consumptive presents itself.

The consumptive being dangerous, largely from his habits, to those who incur danger from ignorance or necessity in these directions, sanatory knowledge is more cogently indicated.

The personal element, the chronic nature of the malady; sentiment, social, religious, economic commercial bearing, all exercise an influence and create a public opinion that prohibits a course of procedure towards it that is directed towards other contagions.

It, therefore, is left us to enforce what we can and thus far and in no mean degree bring about such good results as are possible.

Reporting by physicians and registration by the Health Department of all consumptives, their residences and other facts is reasonable, proper and practical, and permits such action by the authorities, with the co-operation of the physician, as can be exerted.

By this registration it is possible to cause the dissemination of information of vital interest for the protection of the family and the public. It is needless to specify; briefly, it should relate to the disposition of the sputa, disinfection, and should reach those for whom intended through the physicians in attendance, who can adapt, modify and secure the greatest efficiency with the least offense to the individual and household. It permits proper recording, and every Health Department should, from such registration, maintain a register of all homes, dwellings, etc., subject to such infection, record its duration and date of satisfactory disinfection. Such register should be available to the public and those contemplating a change of house, for their guidance and protection, and it should, by ordinance, be incumbent upon owner or lessee, to institute thorough disinfection under heavy penalty.

The disgusting nuisance of indiscriminate expectoration, in street cars, streets and public places should be prohibited by law and made more efficient by creating public sentiment against it.

The difficulty of enforcing such an ordinance is apparent, therefore, the necessity of a strong public co-operation.

Hotels, boarding, tenement and lodging houses should have special information and modes of procedure supplied them, that will enable them to adopt the principles of prevention or minimizing the possibility of infection to the peculiarities of their business.

The street-car conductors should enforce the companies' rules, regarding spitting upon the car floors, with vigor, and every car floor should be properly cleaned with suitable disinfecting fluids.

Cuspidors in public places should contain a disinfecting solution.

Employés in crowded places, as factories, work-shops and similar places should be subject to physical surveillance, and offending cases weeded out. Sanatory rules, cubic air space, rules regulating expectoration, all cogent in the extreme.

If it is indicated to prevent the introduction into the State of tuberculous cattle, so much more is it important to exclude all persons suffering from tuberculosis pulmonalis.

To this end, then, entrance should be interdicted and uniformity of action in all sections of the country aimed at.

The emigration of tuberculous patients in the breaking down stage should be interdicted or discouraged, not only on account of the futility

of it in the majority of cases but from the fact of their disseminating contagion.

No action towards the extinction of tuberculosis in communities would be complete if it did not take cognizance of the factors bearing upon those predisposed.

With this object, the broad field of general attitude to the health and physical development of the young, particularly in the crowded districts, should receive careful attention.

This implies supervision of crowded dwellings, and placing them upon a healthful standard.

School hygiene and calisthenics, public parks, and the well known details too numerous to mention.

Attention likewise is necessitated to penal institutions and the like where, under the influence of crowding, sedentary life, mental depression, this malady is prone to develop.

Public hospitals should have isolation wards and not be permitted to segregate the tubercular in wards with other medical cases.

Preferably, hospitals for the special care of this class of patients should be provided and equipped with the particular features necessitated by the peculiarities of the malady and the morale of the patient.

The establishment of State Hospitals for Consumptives is now receiving the attention its importance demands.

In Germany, these institutions have been in successful operation for years.

Massachusetts is about to open the first in this country and will be followed by one in New York State at an early day.

There is every reason why the State should extend its humanitarian action towards this scourge as towards lunacy.

Tuberculosis among the poor is disastrous in its results, bringing untold misery to families and pauperism to the State.

One source of infection frequently overlooked is the possibility of disseminating sickness through the dealers of second hand clothing and household effects.

Every large city has many of these establishments and without doubt they are frequently the receptacle of cast-off clothing, bedding, etc., from infected households.

While, perhaps, it is difficult in every case to control this condition of affairs as at present, there can be no doubt it would be a wise procedure to supervise this traffic by ordinance and license.

The diarrhœal diseases of infancy prevail with large mortality among all infants but particularly among the poor, and are justly classified as preventable diseases as they are due to toxic bacteria.

The appreciation of this fact determines the action of health officials towards the prevention of food contamination, the source of infection, inasmuch as these maladies are in the main limited to children who have not the advantage of breast milk.

In searching for removable causes of milk infection, none seems more cogent than the so-called long tube nursing bottle.

It is likely well known to all, and consists of the usual form of bottle with the addition of a rubber tube one foot and over in length ending in a nipple, the adaptation being made to permit self-feeding on the part

of the child, thus obviating the necessity of an attendant, a device for a lazy mother or nurse who is unfitted for her sacred trust.

Investigation has shown an enormous proportion of diarrhœal diseases in children artificially fed and using this form of contrivance not found with the use of others.

This explanation is found in the fact that it is impossible to keep this tubing clean or safe.

The mother, usually uneducated in the premises, cannot, by scalding or washing, maintain the inner surface of the tubing in condition so as not to contaminate the milk drawn through it.

I have conducted a series of experiments and investigations in the matter, the details of which I need not detain you with, the result of which, briefly, may be summarized as follows:

The inner surfaces of these tubes are found to be irregular, present porosities and the seams are frequently imperfect.

These indentations become the rendezvous of colonies of micro-organisms, which thrive on the milk which stagnates in them and which cannot be dislodged by any ordinary process of cleansing.

As a result of this condition, milk, receptive of infection by nature aided by artificial warmth, becomes an easy medium for the development of toxines.

At my suggestion, the city of Buffalo has, by ordinance, prohibited the sale and use of these death-dealing bottles, though not without incurring the animus of certain commercial interests who have combined and are arrayed to combat the ordinance.

It is needless to say that the profession has, without question, given its hearty support to the stand taken by the Department and that the issue will be carried to a finish.

If ordinances created to correct so patent a cause of infantile mortality can be set aside for commercial reasons, health laws in the future will have small chances for their existence.

Municipal protection of the milk industry constitutes a large and most important agent in diminishing the causes of infantile mortality.

To secure this end, city milk houses should answer to the following principal requirements:

1. Proper light, air and ventilation.
2. Constructed of non-absorbent material.
3. Without direct communication to sleeping apartments, water-closets or any unsanatory room.
4. Use for milk storage solely.
5. Storage and cooling boxes metallic lined, elevated and placed to permit thorough cleansing.
6. Sanitary plumbing, outside box ventilation, indirect drainage.
7. Sanitary rules posted conspicuously pertaining to cans and protection of milk.
8. Prohibition of the use of disinfectants—any necessity for their use implying unsanitary condition.
9. Prohibiting the leaving of bottles or receiving the same from any house placarded for contagious diseases, and prohibiting milk-men from refilling or filling bottles on wagon or while on route.

The elimination of pernicious influences upon diarrhœal diseases of infancy by maintaining a high degree of excellence in all that bears upon

it would be incomplete without the co-operation of mothers in carrying out in the home life the principles of infant hygiene.

To secure this to the household containing a new born child, the Buffalo Department of Health furnishes a circular of information, covering the essential points which mothers should observe in the care and management of the infant.

That this may reach and have its influence upon all classes, the matter is printed in several languages, is couched in simple words and the directions given plainly and practical.

Such circulars of instruction should, and, in Buffalo, include the following:

1. Directions for bathing and cleanliness, for properly dressing and changing the infant.

2. Directions for sleep, regulating the hours and urgently warning against the use of sleeping drops, cordials and the like.

3. Directions for securing abundance of fresh air, suitable hours for airing the child and the importance of avoiding the devitalizing effects of the heat within doors and without.

4. Directions for simple household hygiene, as regards ventilation, dampness, odors, etc.

5. Directions, in detail, for feeding, weaning, various artificial foods. The preservation and sterilization of milk, methods of cleansing and keeping clean feeding bottles, utensils and the like.

The selection of proper feeding bottles and condemnation of the long tube design.

6. The symptoms readily recognized by mothers necessitating medical attendance, and the evidence of normal digestion.

It is gratifying to know that these circulars are appreciated among the poorer classes, are lived up to as much as possible and have a salutory influence in the premises.

The principles involved in the subject under consideration have of necessity been but referred to and are intended as suggestive and to bring out the views and experiences of those among you who have given these matters much thought. The field is a most inviting one and it is through such exchange of views as is possible here that present action and procedures can be fortified, new ones made operative.

Sanatory science has been and is so progressive that any action that will proportionately annihilate the various contagions will redound to the happiness and welfare of the community and the honor of our art.

Chairman Wells—The last topic upon the program for this afternoon, "Sanitation of the Future," by Prof. Vaughan, will necessarily have to be omitted, owing to the absence of Prof. Vaughan. This distinguished gentleman is not only a bacteriologist and sanitarian, he is in addition to these a patriot. Early in the war he offered his services to his country. These were promptly accepted by the government, and Dr. Vaughan was despatched at once to the front. In the field and in the hospitals at Santiago he labored day and night to relieve the sick and the wounded until himself stricken with yellow fever. I am most happy to announce his recovery from this disease and that today he starts for his home to regain his strength and to continue his career of usefulness.

This concludes our afternoon program and I now declare this session closed.

Evening Session, Tuesday, August 9, at 8:00 P. M.

After music by the Cadillac Hotel Orchestra, the meeting was called to order by Hon. Frank Wells.

Chairman Wells—Our program contemplates the devotion of an hour at this time to five-minute addresses by eminent gentlemen, from different parts of the country, who are engaged in different lines of health work. While the time allotted to each is too short for extended observations upon any of these lines, yet we hope to get germs of knowledge from each which we may take home with us, produce from them cultures, and, by aid of our mental microscopes, obtain a better conception of what these germs of knowledge express. Perhaps by inoculating ourselves with cultures of them we may secure immunity from some of those sanitary fallacies which so often become epidemic.

We shall first listen to a representative of one of Michigan's most distant sister states in the south—Dr. Felix Formento of Louisiana. Dr. Formento is an ex-president of the American Public-Health Association, and has labored many years with zeal and efficiency in his own State Board of Health, of which he has been a most valuable member. This is not his first visit to Michigan and we hope it will not be his last. I present to you with pleasure Doctor Felix Formento of New Orleans.

FELIX FORMENTO, M. D, NEW ORLEANS, LA.

EX-PRESIDENT OF AMERICAN PUBLIC HEALTH ASSOCIATION.

It would be impossible in the short space of time allotted to each speaker, to pretend to anything like a set speech.

I can but express my grateful thanks to the Board of Health of this great State for the honor they have conferred upon me by inviting me to say a few words on this grand occasion of the Quarter-Centennial Anniversary of the establishment of the Michigan State Board of Health.

Louisiana sends her greetings to Michigan.

The land of Bienville and Iberville recalls to the land of Cadillac and Father Marquette their common origin.

One of the first organized in the country, your Board stands to-day at the head of similar organizations, not only of the United States, but of the civilized world; especially in matters pertaining to vital statistics, and in methods of prevention against domestic diseases and foreign pestilence.

Many of your measures have served as models to State and municipal Boards throughout this great country.

Nowhere is Public Hygiene more advanced, more enlightened, than in this noble State of Michigan. You have educated the people to the necessity of local sanitation—nowadays, every citizen, rich or poor, takes a lively personal interest in hygienic and sanitary matters. The ignorance, indifference and neglect of former days have given place to a generous, praiseworthy emulation to improve and beautify your cities, towns and villages. Every one now understands that Public Hygiene has its origin in Private Hygiene and that true progress in Sanitary matters must have its point of departure at the very home, at the fireside of each and every citizen.

As a result of your enlightened efforts, your cities and towns have been made clean, healthy and attractive. No State, no country, can boast of a more beautiful, more charming and more delightful city than this very city of Detroit, where we meet to-day under such auspicious circumstances.

Thanks to your advanced sanitation, your death-rate has been greatly lowered and the public wealth has been immensely increased, with a corresponding progress in every branch of human knowledge and industry.

Continue your noble and generous mission, gentlemen. Your reward will be the welfare and happiness of your fellow-citizens, their grateful appreciation and the blessings of future generations.

May I here be permitted to express a wish, the wish of a Sanitarian? There are still several sanitary practices which are not sufficiently understood and appreciated by our people; there are still some great reforms to be introduced among us, which are especially required in cities and thickly-populated localities.

I refer particularly to Cremation—cremation of garbage as well as of human bodies, the latter especially in cases of infectious and contagious diseases—cremation which we have vainly endeavored to introduce in my native city, where it is perhaps more needed, as a sanitary measure, than anywhere else, cremation, that great purifier, which destroys and removes absolutely the active agents of infection and contagion and solves forever the problem of the transportation of the dead, rendered, thereby, perfectly innocuous.

With all the arguments, sanitary, philosophical, economical, in favor of Cremation, why is it that this essentially useful and hygienic measure encounters so much opposition among our people? Can it be on account of the ignorance, bigotry and prejudice that still exist on that subject? We believe that placed under your patronage and championed by you, this practice of Cremation would soon become better understood and appreciated. Who could better enlighten the people and remove prejudice and false ideas, and prepare public opinion for the adoption of one of the greatest sanitary reforms of the age, one which is intended to bring sanitary results of incalculable importance?

Another great object worthy of all your efforts is the problem of local sanitation in our new conquest, the Island of Cuba. You should join, you should lead in this new crusade for science against a foreign disease which should never obtain letters of naturalization among us. Cuba must be regenerated, not only politically and socially, but hygienically. It is not enough to have delivered Cuba from Spanish tyranny; that was comparatively an easy task. We must free it from Yellow Fever and its still more pernicious Malarial Fevers; they must be stamped out in their very cradle. The problem is a difficult one, but not beyond the means and resources of Modern Sanitary Science and Sanitary Engineering. Our country, our Southern States more particularly, must forever be delivered from the constant threat of invasion by an enemy more dreadful than the foreign armies and navies of the world.

The stamping out of Yellow Fever in Cuba—which will lead to the stamping out of the disease in Central and South American countries—will be the crowning glory of and a lasting monument to the wonderful achievements of American Sanitary Science.

Chairman Wells—The next speaker, though a Michigan product, was unfortunately transplanted several years ago to a neighboring State. Before this event he had done good service in the legislature of Michigan, and excellent work as a member and president of the Michigan State Board of Health. New soil often changes or modifies transplanted products, and the Michigan sanitarian became a prominent

lawyer of Buffalo, as a result of his change of location. Early habits could not be entirely eradicated, however, and among his several valuable legal writings those on the public-health laws of the United States, are most valuable. I introduce to you Hon. Le Roy Parker, ex-president of the Michigan State Board of Health.

HON. LeROY PARKER, BUFFALO, N. Y.

PROFESSOR OF LAW; BUFFALO LAW SCHOOL.

Mr. President and Ladies and Gentlemen:—It is impossible for me to fully express the gratification I feel at meeting again with the Michigan State Board of Health, and to participate in the Quarter-Centennial Celebration of its establishment. It is a pleasure for all of us to meet here and take part in the celebration of the completion of twenty-five years of such noble work for humanity as the Michigan State Board of Health has performed, but it is doubly so for me, who for six years served as a member of that Board and participated to some extent in its work.

At the time of my appointment by Gov. Croswell as a member of the Board in 1877, it had not completed the fourth year of its existence, but it had already become a living force in the work of prevention of disease through the collection and tabulation of vital statistics and the dissemination of valuable and useful information among the people of the State. It had become an educator of the people in all matters relating to the maintenance and preservation of their health. How could it be otherwise when its first membership consisted of such men as Dr. Hitchcock, Dr. Bliss, Dr. Kedzie, Rev. Mr. Brigham, Dr. Lyster, Rev. Mr. Goodman, and that indefatigable collector and tabulator of statistical information, whose retention by the Board as its Secretary, from its first organization to the present time, is the best possible proof of his invaluable services, Dr. Henry B. Baker?

After an absence of many years I return, at the invitation of your Governor, from New York, the State of my adoption, to the State where I was born and where I spent the years of my early manhood, and find that the Michigan State Board of Health is in the very front rank of those which are fighting against disease and death, and which, by its untiring and well-directed efforts, is adding years to the life of man and wealth to the State.

It is one of the noblest works of humanity to prevent disease, disability and death, and such prevention increases, incredibly, the productive resources of the Commonwealth. No economic measure that the State can foster, will, in my opinion, (and that opinion is based upon innumerable statistics), add more to the sum of human happiness and to the wealth of the people and the obliteration of preventable diseases and the consequent prolongation of hale and productive life.

I need not quote the figures of statisticians to show how great is the drain upon the purses of the people of the State for the expenses of sickness that might be prevented, nor how great the pecuniary loss in the destruction of lives that might be saved for many years of productive industry. You are too familiar with them to require a repetition here.

In the introductory address of Dr. Homer O. Hitchcock, at the organization of the Board of Health of Michigan, July 30th, 1873, he outlined

with wonderful prescience what the work of the Board should be and what might be gained by the people if that work were carried out. One portion of the work for the Board to do, which he particularly emphasized, was "*to educate the people in respect to the nature and causation of diseases and the means for their prevention.*"

Following this direction of its first President, the Michigan Board of Health has most persistently carried on a campaign of education, directed against the ignorance of vital truths respecting their own bodily welfare which prevailed among the great mass of the people.

To get the people to think, it has distributed broadcast millions of pages of printed instruction concerning those diseases that were dangerous to the public health. It has held sanitary conventions in almost every city and village in the State, for the more immediate arousing of popular interest and to lead the people to act. It has called public attention, unceasingly, to the simple means of preventing disease. It has enlisted the most cordial co-operation of the Medical profession in its preventive work, thus taking bread out of the doctor's mouths as it were.

It has inspired the law makers to enact the necessary legislation to compel the people to be healthy. It has created a spirit of emulation among public officials to enforce such laws, and, greatest of all its educational work, it has made the teaching of sanitary measures compulsory in the schools of the State.

This great idea for the education of youth was, I believe, first urged upon the public by Dr. Baker, the Secretary of the Board, at a Sanitary Convention, held in Albion in this State, in 1887. Like other great ideas for the public weal it developed slowly, but in 1895 it became a law of the State.

The law is as follows:

Act No. 146, Laws of 1895

An Act to provide for teaching in the public schools, the modes by which the dangerous communicable diseases are spread and the best methods for the restriction and prevention of such diseases.

SECTION 1. *The People of the State of Michigan enact*, That there shall be taught in every year in every public school in Michigan the principal modes by which each of the dangerous communicable diseases is spread, and the best methods for the restriction and prevention of each such disease. The State Board of Health shall annually send to the public school superintendents and teachers throughout this State printed data and statements which shall enable them to comply with this act. School boards are hereby required to direct such superintendents and teachers to give oral and blackboard instruction, using the data and statements supplied by the State Board of Health.

SEC. 2. Neglect or refusal on the part of any superintendent or teacher to comply with the provisions of this law, shall be considered a sufficient cause for dismissal from the school by the school board. Any school board wilfully neglecting or refusing to comply with any of the provisions of this act, shall be subject to fine or forfeiture, the same as for neglect of any other duty pertaining to their office. This act shall apply to all schools in this State, including schools in cities or villages, whether incorporated under special charter or under the general laws.

What a possibility for incalculable good is embodied in this law. In the State of Michigan there are about half a million school children enrolled, with sixteen thousand teachers, whose duty it is to teach to them the simple facts of sanitary science. Facts rather than theories are taught, and we all know that a fact simply taught, at a time of life when

the mind is most plastic and impressible, becomes indelibly fixed therein, while the same fact elaborated into a tract or a treatise too often fails to impress the maturer mind.

What will the harvest be after such a planting of ideas in the minds of our youth? Will it not be rich in a fuller and more perfect life? In the greater freedom from disabling ailments; in the practical elimination of contagious or communicable diseases; in the extension of the period of productive strength in man far beyond his present capability, and a vast increase in the wealth of the State? I firmly believe that it will.

Educate the youth of the State and in the perfection of their manhood will the whole Nation rejoice.

WALTER WYMAN, M. D., WASHINGTON, D. C.

SUPERVISING SURGEON GENERAL OF THE U. S. MARINE HOSPITAL SERVICE.

In a letter dated July 30, 1898, Doctor Wyman wrote the Secretary of the State Board of Health, as follows: "I look forward with much pleasurable anticipation to the meeting on August 9 and still hope to be able to go. We are right in the midst of the fight, however, and just at the present moment I am deeply engrossed in preventive measures, against yellow fever from Santiago, of a very broad scope and involving many details. I have not left town for one day, not even Sunday; so that, if I telegraph you I cannot come, you must feel that it is because it is absolutely impossible for me to get away."

Chairman Wells—The duties of the head of the Marine-Hospital Service of the U. S. are complex, onerous and exacting. They not only demand that each seaman belonging to the merchant service of the U. S. shall have the best medical and surgical attendance when sick or injured, but, since the abolition of the National Board of Health, it is made the duty of the supervising officer of this department to have charge of both interstate and seaboard quarantine. The present incumbent of this high office, Walter Wyman, Supervising Surgeon General of the Marine Hospital Service, who it was expected would be one of the speakers this evening, is unable to leave his post at this critical period. I will ask Judge McAlvay to read a telegram just received from Doctor Wyman.

Washington, D. C., Aug. 8, 1898.

Doctor Henry B. Baker, Secretary State Board of Health, Hotel Cadillac, Detroit, Michigan:

Regret very much that pressing duties in connection with quarantine measures for return of army prevent my leaving. Express my personal regrets to the Governor. Accept my congratulations both for yourself and the Board of Health on this the twenty-fifth anniversary of the Board.

WALTER WYMAN.

Chairman Wells—The next gentleman upon our program is a former member of the Michigan State Board of Health, and for ten successive years its president. He was one of its most valued members, and took an active interest in all its labors. In a moment of weakness he yielded to temptation and became a member of Congress. It is pleasant to know that his reputation has not appreciably suffered from this lapse, nor has his character been contaminated during the two terms of his service in that body. This last statement may have to be qualified, as this gentleman, Doctor John Avery, does not seem to be present, although he had given us reason to believe he would be here.

HON. JOHN AVERY, M. D., GREENVILLE, MICHIGAN.

EX-PRESIDENT OF THE STATE BOARD OF HEALTH OF MICHIGAN.

In a letter to the Secretary of the State Board of Health, dated Aug. 9, Doctor Avery wrote: "Owing to sickness in my family I find it will be impossible for me to be present at the Quarter-Centennial Celebration of the Michigan State Board of Health. I regret this very much, as I had anticipated much pleasure in meeting my old friends and the many public-health workers who will be present. The last quarter of the century has been marked by great advance in sanitary science along the lines of practical utility, and I congratulate the Michigan State Board of Health that it has kept fully abreast with this advance."

Chairman Wells—The relations which exist between the Dominion of Canada and the United States are not alone those of a political or commercial nature; there is a family relation which is stronger than either of these and which holds in the bonds of kinship all people who speak the English tongue. In the hour of trial this has been made manifest to us in ways that have strengthened the arms and inspired the hearts of our patriots and soldiers. Michigan reciprocates the many expressions of good will and friendship from her relatives over the border, and has a representative of her closest neighbor on the east, the Province of Ontario, to speak to you tonight. We are greatly indebted to him and the board he represents for efforts in the past to guard us from dangerous communicable diseases. I introduce to you Doctor Bryce of Ontario.

PETER H. BRYCE, M. A., M. D., TORONTO, ONTARIO.

SECRETARY PROVINCIAL BOARD OF HEALTH.

Mr. Chairman, Ladies and Gentlemen:—On this occasion, called upon with my fellow sanitarians and this splendid audience to celebrate the twenty-fifth anniversary of the establishment by law of a department of public health in Michigan, I feel it especially appropriate that as representing Canada, I should convey to the people of Michigan the blessing of a mother to her firstborn and perhaps most illustrious child, who rejoices in the fulfillment of the motto inscribed by that old hero, Governor Cass, on her first State Seal—"*Tandem fit surculus arbor.*"

For me no page in the history of the Michigan peninsula has a charm equal to that where the crusader knight and discoverer, La Salle, leaving his seignory on the fair Lac Saint Louis, started in 1670 on his search for the holy grail—the route to China—in this western world, and first planting the *fleur de lis* on Longue Pointe, Lake Erie, in the name of Louis le Grand, pushed his canoe over the perilous lakes and entering the Strait, landed where Yon-do-ti-ga, the great village of Detroit, now stands, and exorcised by axes and drowning the demon, in the painted Manitou stone, which your historic ancestors worshipped on this spot; and how he further visited dear Père Marquette at Michillimackinac, and the Illinois of Kaskaskia, and by almost superhuman efforts delineated your territory through crossing from the now Chicago to the Detroit again by the river Xavier, your own Huron.

Indeed from the time La Mothe Cadillac built Fort Pontchartrain in 1701 till the time when General Brock paid Detroit a friendly visit in 1812 we Canadians have taken the deepest interest in the history and fortunes of Michigan, and can rejoice with her citizens in the story of how

Lieutenant Gladwin held the fort, as Horatio the bridge, in the old fighting frontier days when Pontiac made history, and left us memories of "Bloody Run", and the base-ball game at Mackinaw. But beside the interest which Canadians have shown for the people of Michigan during all these centuries you owe us a debt of gratitude for manifold favours. From the river Raisin northward and from Marquette southward you hear, whether from steamboat captain or railway brakeman, euphonious names familiar to every lover of Old Canada, though often the poor name, like an old flag that has done duty, is often sadly tattered and torn; and one may be forgiven for recalling the days of long ago when he hears of such philistinish names as Turkey, Mama-Juda and Humbug profaning the islands of the noble river.

Yet more than thanking us for names, you must thank us Canadians for populating your fair land.

Who does not know that in the old pioneer days, when many thousands were pushing westward to the new lands from the eastern states and New York, that many stayed with us over in Western Canada, and that after being taught many good and wise things, they pushed on farther westward, some for your good, and others for the good of the country they left; so that from 1832 onward, Michigan has been employed in making homes for, and having her resources developed by, something like half a million Canadians, and for fear that the records of the patent office, if left in Detroit, would show the real nationality of the people of the State they were in 1857, quietly transferred to Lansing, and since that time the title to the property of this State has become very much mixed.

But if as Tennyson says:

> "This truth within thy mind rehearse
> That in this boundless universe
> Is boundless better, boundless worse,"

this occurrence seems to have resulted in bringing into touch with these records of the State two patriotic citizens and studious physicians, who delving into historic lore, and reading of the glorious deeds of Surgeon George C. Anthon, attached to the Detroit post in the old Pontiac days, and of the holy and reverend Father Martin Kundig, the undying hero of that terrible cholera year 1834, when he bought an old church, and in 24 hours had taken out every alternate seat and made the space into a bed, were fired with a holy desire to emulate such glorious achievements and so it came about, Ladies and Gentlemen, that Ira Hawley Bartholomew (obiit 1889) and Dr. Henry Brooks Baker began the crusade in the cause of public health, which resulted in the formation of a State Board of Health in 1873. Since that date the attacks upon the "infidels", and the return assaults of the Saracen foe are matters of history to all of you. Of the workers, and work done during these twenty-five years I need not speak at length. For myself, looking back I find that it is twenty-one years, since, as a teacher of chemistry, I first visited Lansing and met my dear old friend, the Nestor I believe of the Michigan State Board of Health, Dr. Kedzie. I seem almost to have known the work since its inception. Certainly since 1882 when the Provincial Board of Health of Ontario was created, I have known the work and workers of the Michigan State Board of Health

intimately as fellow workers, and as leaders in the holy war against disease and all causes of ill health. Fired with the enthusiasm of the Secretary and members of this Board, I trust that something of it was transmitted to Canada, and that in this, as in so many instances, the young man has, from a foreign land, sent back to the mother, something from the store of wealth which her lessons taught him how to obtain.

To the people of Michigan who, through their representative citizens, are gathered here tonight to do honor to themselves by honoring those who for twenty-five years, whether in the Legislature, in the State Board, or who as officers of health of your 1,500 municipalities, have elevated the standard of wealth, health and happiness by teaching and helping the people to enjoy and preserve the highest gift of the Giver, a sound mind in a sound body, I bring Canada's Greeting to encourage you to still greater efforts to fulfill to its utmost the ideal of the motto on your State crest—

Si quaeris peninsulam amænan circumspice!

Chairman Wells—However just may be the criticism that States and governments make more liberal contributions to secure health for domestic animals than for man, yet the value of work done to prevent diseases in animals can scarcely be overstated. So many diseases are common to both man and animals and are capable of being communicated from one to the other that restriction of such diseases in animals furnishes a large degree of protection to humanity. Doctor Salmon, Chief of Bureau of Animal Industry, in the Department of Agriculture at Washington, has this work of restricting diseases in animals in charge for the general government. Most of you are familiar with his efforts in this direction and appreciate their value, and I take great pleasure in introducing to this audience Doctor Salmon of Washington.

D. E. SALMON, D. V. M., WASHINGTON, D. C.

CHIEF OF BUREAU OF ANIMAL INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE.

I desire to add my congratulations to those of the distinguished gentlemen who are participating in this notable celebration. If the founders of the State Board of Health of Michigan had been endowed with prophetic vision and had desired that the first quarter century of this institution's existence should be passed in the most active period in the history of sanitary science they could not have selected a more auspicious time for its organization than the year 1873. We were then just upon the threshold of a new era. The human race had reached a point in its development where, out of the utter darkness which had enveloped the subject since the beginning of history, its foremost investigators, peering through the obscurity which surrounded them, could discern a faint ray of light which appeared to be growing stronger in the field of infectious diseases, and which had already kindled the hope that in the fullness of time the cause of these plagues would be revealed.

It is impossible in the time at my disposal to so much as enumerate the wonderful discoveries which sanitary science has laid at the feet of humanity during this active and prolific period. But even an enumeration is unnecessary since all remember how closely one announcement of

successful investigation has followed another, until the causes of many of our most dreaded diseases have been made clear. A few contagious diseases still resist the powers of the microscope and the culture tube, but as one after another has yielded to new methods and greater experience, we have confidence that in time all will be conquered. The present condition of knowledge justifies us in asserting that the mystery of contagion so long impenetrable is solved; that the great scientific principles are established, and that what remains to be learned is for the most part a matter of details.

Possibly the immensity of this achievement does not appeal to the younger sanitarians or to the laymen with the same force that it does to me. Having contemplated the blackness of our ignorance a quarter of a century ago, and being one of those who sought long and anxiously for a favored point at which a little light could be made to penetrate, I can scarcely realize that the night has passed forever, and that henceforth the sanitarian will do his work in the full light of an almost cloudless day.

The knowledge as to what constitutes the active principle of infectious material enables us to avoid such material in many ways. It has brought us scientific disinfection, the aseptic treatment of wounds, the methods of changing a deadly virus into a prophylactic vaccine, and it has given us anti-toxic serums for the prevention and cure of communicable diseases. These are the results, in general terms, which to my mind are preëminent among the achievements in sanitary science during the quarter century in which this Board has participated.

My work during this period has been of a somewhat different character from that in which most sanitarians have been engaged. It has been confined entirely to the diseases of animals, and the organization and direction of work for preventing the spread of such diseases from animal to animal and from animals to man. This service joins and overlaps the work of the Health Boards, and it has been my fortune to receive the most cordial coöperation and the most valuable assistance from these Boards in the various States and municipalities. It is to the friendly relations thus established that I no doubt owe the opportunity and the pleasure of being here and taking part in these interesting proceedings.

Let us consider for a moment what has been accomplished in this special field of sanitation. Twenty-five years ago, we could hardly claim that there was a veterinary profession in the country, so few were the followers of that branch of medical science. Animal plagues were rampant; there was little knowledge of their nature, or of the means by which they might be controlled; legislation for this purpose had scarcely been attempted, and the consumer of meats had practically no protection from dangers due to the ignorance and avarice of the butcher. We have today a Bureau of the Federal Government devoted to this work, which receives an appropriation of nearly a million of dollars a year and has in its service over one thousand persons. It is not, however, to the sum of money expended nor to the number of persons employed to which your attention is especially invited, but rather to the work performed.

There existed in this country twenty-five years ago, and, I might say, fifteen years ago, that terrible scourge of the bovine race known as contagious pleuro-pneumonia or lung plague. It had gained a lodgement in at least half a dozen States. It threatened the vast capital of nearly a thousand million dollars which we had invested in the cattle industry,

and it also seriously affected the domestic and foreign commerce in bovine animals and their products. It threatened to this extent the food supply of the nation. As it had ravaged the herds of Europe for a century notwithstanding extraordinary efforts for its control, there were many who believed its eradication to be beyond the powers of sanitary science. For the sake of brevity, I will merely say that this contagion has been so completely extirpated from American soil that not a single case has been observed during the last seven years.

There was also another fatal disease of cattle called Texas fever, a disease with such mysterious and apparently contradictory characters that its very existence was doubted and the accounts of it were pronounced by some authorities as a "romance in pathology." It was found that the contagion of this disease exists permanently over an immense area of our territory, but the mystery has been removed, the problems have been elucidated and the disease is now so completely under control that the great mass of our stock-raisers no longer give it a thought. The discovery that the contagion of this disease remains permanently in the blood of affected animals and is only disseminated by a particular species of cattle tick has enabled us to perfect special prophylactic measures which are now about to be introduced. There have for some years been but two problems which had not been satisfactorily solved. Means had been devised for shipping animals from the affected district for immediate slaughter, and indeed for other purposes during a part of the year, without danger of disseminating contagion; but it was desired to take improved animals into the infected district, and also to freely ship infected cattle without quarantine or other sanitary restrictions. After a long series of investigations the data have been obtained for accomplishing both of these objects,—the former by inoculation, the latter by passing the infected animals through a petroleum and sulphur bath.

We have, also, a disease, or rather two diseases of swine in the United States which have destroyed enormous numbers of these animals, and thereby blotted out invested capital to the extent of thirty to eighty million dollars a year. To arrest this annual drain upon our resources would of itself bring prosperity and wealth to some of our greatest States. This problem has been one of the most difficult ones, for a number of reasons, that sanitary science has ever attempted to solve; the investigations have continued for twenty years with ample resources supplied by Congress and it is only within the last year that we have found a method of treatment that gave promise of success. That method consists of the use of a special compound anti-toxic serum so prepared as to prevent and cure both of these diseases. It has been demonstrated that this serum gives excellent results with small animals in the laboratory and last year it was used on a small scale in the field, saving 75 per cent of exposed animals, whereas but 15 per cent were saved without serum. This year preparations have been made to use the serum upon a large number of animals—the plan being to treat all of the herds in a county or in several counties in which the disease appears during a period of a year, and then compare the losses in the district where this measure is adopted with those in adjoining counties. The application of this remedy, after the experimental stage is passed, should undoubtedly be as a sanitary measure under the supervision of sanitary authorities and with a view to gradually eradicate the disease.

Another public service of vast dimensions which has been inaugurated within this period is the inspection at the time of slaughter of animals the meat of which is intended for the interstate or foreign trade. The importance of such an inspection must be apparent to any one who considers the vast numbers of crippled, diseased and dead animals which arrive at all large slaughtering places, and the additional fact that at all such places there are unscrupulous persons ready to impose upon the consumers by placing the meat of such animals upon the market. During the last year more than twenty-seven million animals were inspected, those injured, diseased or otherwise unfit for food were condemned and the meat of the healthy ones was certified as free from disease, sound and wholesome.

It has also been found essential to inspect and quarantine animals of all species which are brought into the country, in order to prevent the importation of contagious diseases.

There has been briefly sketched in these few words a vast sanitary system which the United States Government applies to animals with a view not only of controlling the diseases of animals, but of protecting the health of the people by guarding against the transmission to mankind of diseases originating with animals. Every part of this system including its inception and development has occurred during the lifetime of this Board.

We come together on this occasion and mingle our congratulations without reservation of any kind. The establishment of the Michigan State Board of Health was a good thing for the State and for the Nation. Its growth in power and influence until it has reached the age of a quarter of a century is a fit subject for rejoicing. This initial period of its existence has fallen in a time of unrivalled activity, of dazzling opportunities and of amazing achievements. But all is not finished. As twenty-five years ago we stood at the threshold of a new era, so today we can see the promise of great things that are to be accomplished in the near future. Let us conserve what we have. Let us maintain the high standard of professional ethics which has been established in this country, which is the glory of our medical profession, and which forbids that humanity shall be forced to pay exorbitant tribute to commercial greed in order to benefit by the great discoveries of medical science. Let us use our influence to keep the production of anti-toxins out of the control of monopolies; so that these great discoveries of modern science may remain within the means of the humblest in the land and may be used for animal as well as for human diseases. Let us stand shoulder to shoulder and make the results of the next quarter century even more notable than have been those of the past.

Chairman Wells—The state of Kentucky, noted for its blue grass and its corn, is a land of plenty. Its blue grass furnishes food for its splendid animals and its corn food and tonic not only for its own but for the citizens of the whole Union. But the state is not noted for those alone. It has for Secretary of its State Board of Health a most genial and competent man, whose name appears upon our program as one of the speakers tonight. I learn that his duties at home will prevent Doctor McCormack being with us this evening, and that Doctor Bailey, president of the Kentucky State Board of Health, will speak in his place. Permit me to introduce to you Doctor Bailey.

WILLIAM BAILEY, M. D., LOUISVILLE, KY.

PRESIDENT OF THE STATE BOARD OF HEALTH.

I have no paper—have had no time to prepare one; but I present the congratulations of Kentucky upon this occasion, to the Michigan State Board of Health upon its successful completion of its twenty-five years of philanthropic labor. Knowing Michigan, knowing its delightful climate, its great lakes, its beautiful cities and the hospitable people, I was delighted to come to this Quarter-Centennial Celebration, in fact I came several days ago, and have been enjoying myself to the utmost ever since I came.

As to the tonic, which your President suggests my State is famous for, I would remind Mr. Wells that the Flats are broad, and I find, after several days' sojourn there with some of Michigan's sanitarians, that the "tonic" is exhausted.

I was surprised to hear the climate of Michigan, its curative waters, its great lakes and the innumerable delightful resorts so modestly mentioned by your President. I am prepared to be more enthusiastic, for the great expanse of blue water, the cool pure breezes, the delightfully-tempered climate and the more than delightful places of rest for the tired and sick impress me most pleasantly. My visits to Michigan have been most delightful. Twenty-five years ago I first came to this State seeking health and rest among the beautiful invigorating scenes, and then I met Doctor Connor and Doctor Jenks. I first met a representative of the Michigan State Board of Health in 1879 at Nashville at the meeting of the American Public-Health Association; since then I have missed only one meeting, and some of these men have been present at nearly all of them.

We are indebted perhaps to the State Board of Massachusetts for being the first established, and that Board and the Michigan State Board of Health I regard as chief in sanitary matters, and first in the march of progress for the improvement of the sanitary conditions of the people.

Your work is not limited to your own State, and to the improvement of your own people, but its influence is spread over all the States, and is a source of encouragement to them, stimulating them to more successful labors, leading them in the paths of improved sanitation, and teaching them what may result from persistent intelligent labor for the good of mankind.

These sanitarians deserve success in their forward march against disease and death. Their opportunities are very great, and their responsibilities are in like degree. I give them God speed.

Chairman Wells—It is said of Kentucky that

> "Its corn is full of kernels
> And Colonels full of corn."

Doctor Bailey is not a colonel, and he is full of good ideas, from whatever source they may come.

Chairman Wells—Vital statistics are to the sanitarian what the balance sheet is to the merchant. Each, if correct, shows whether gains have been made or losses sustained. Vital statistics in Michigan are not collected by the State Board of Health, although it is required by law to make diligent use of them. They are

under the charge of a gentleman in this State who, in addition to unusually efficient work in this department, has secured the passage of an act which has resulted in giving to Michigan vital statistics as nearly correct as it is possible to have them. This gentleman, Doctor Wilbur, I now take pleasure in introducing to you.

CRESSY L. WILBUR, M. D., LANSING, MICHIGAN.

CHIEF OF DIVISION OF VITAL STATISTICS, DEPARTMENT OF STATE.

It becomes my pleasant privilege to say a word as the representative of the vital statistics service of the State, which in Michigan, as you know, is not conducted by the State Board of Health but by the Department of State. The relation of these two branches of the public-health service—the collection of vital statistics and the practical work of restricting disease—is so intimate that in most States they are performed by a single department of the State government. In Massachusetts, Michigan, Ohio, and Vermont until recently, the services are distinct for the historical reason that the collection of vital statistics was begun before the State boards of health were in existence. Thus we in the registration work may look upon our friends in the health service with a sort of elder-sisterly affection, and while not engaged directly in the work of sanitation, we can nevertheless feel a degree of personal pride when we recognize the good results of such work—it's all in the family, you know.

In fact, the connection between the modern science of sanitation and the collection of vital statistics is even closer than we have suggested. With more time, we might allude to the sequence of events in Great Britain as evidence of this,—how Dr. Farr's great work in the establishment and administration of the national system of registration of deaths first called attention, with proofs that admitted of no question, to the urgent necessity for sanitary improvement. From that time to the present the most effective workers in sanitation have been those who utilized most fully the important lessons of vital statistics. Individual experience is often misleading, because it does not include a sufficient number of events. Statistics deal with large numbers, with the movement of the population in the mass, so that the individual peculiarities are eliminated, and the great laws of the incidence and prevalence of diseases stand revealed. But a mere mass of facts does not constitute statistics, in the proper sense, any more than an undisciplined mob of men would constitute an army. Discipline is as necessary in marshalling facts in science as in arraying men for war, and well-drilled statistics have stormed many an outpost of ignorance in the past, and won many a citadel for hygiene from the hands of the enemy. Only modern rifles and smokeless powder are of use on the battlefield today, and the sanitary army has little use for any other than the best modern equipment in vital statistics.

I am glad to say that Michigan has today a registration system for deaths that stands second to no other State system in the country for promptness and accuracy. Up to less than a year ago the Michigan State Board of Health had no reliable statistics of mortality for the State, and those that were obtained under the old law were so tardy as to be of little immediate use. You have all, I presume, seen the Michigan Monthly Bulletin of Mortality, issued by the Department of State

soon after the close of each month, which shows the deaths from dangerous communicable diseases in every city, village and township in the State. This information is in time to be of interest to the people and of practical importance to the local health officers, as well as to the State Board of Health. During the nine months from October, 1897, to June, 1898, no less than 1,317 deaths from dangerous communicable diseases were first brought to the attention of the State Board of Health through this Bulletin, the health officers whose duty it was to do so not having properly reported them. This enabled immediate action to be taken, with the result of undoubtedly limiting the spread of disease in many cases.

From Connecticut, through New York and Ontario to Michigan, the epidemic prevalence of diseases can now be followed in monthly bulletins issued shortly after the close of the month. Such prompt reports, immediately available for sanitary use, exist in no other states, that is, of course, representing entire State areas. It is a much simpler matter to issue a prompt report of urban mortality only.

The triumphs of the Michigan State Board of Health in the past have been won in the face of many difficulties as regards exact information of the conditions attending the mortality of the State. With these hindrances removed, it would seem that we might anticipate even greater usefulness in the future. In behalf of the Michigan State registration service, and voicing especially, as I believe, the sympathy and cordial co-operation of the nearly 1,500 local registrars of the State in the noble work of restricting and preventing disease, I congratulate the Board on its record in the past and rejoice in the splendid outlook for the future. I thank you for your kind attention.

Chairman Wells—The next speaker, Dr. J. N. Hurty, Secretary of the Indiana State Board of Health, is well known to most of you as Secretary of the Conference of State and Provincial Boards of Health of North America, which opens its sessions here tomorrow. He is one of the most vigorous of the sanitary workers in this country, and is a most loyal citizen of one of our nearest neighbor states. I introduce to the few of you who do not know him, Dr. J. N. Hurty.

J. N. HURTY, M. D., INDIANAPOLIS, INDIANA,

SECRETARY OF THE STATE BOARD OF HEALTH.

I have the honor to bear to this celebration the greetings and congratulations of the State immediately on the south. Indiana is proud to be in geographical as well as social touch with Michigan. A look at the map shows that my State bears upon her shoulders this beautiful, salubrious and enlightened peninsula. Projecting north from Indiana, Michigan extends into the midst of our great inland seas. This State is thrice, yes, four times blessed. The breezes from the east lose their dust and microbes in Huron. The winds from the north are washed by mighty Superior, the air coming from the west is purified by Lake Michigan, and the atmosphere which comes from the south, while not dustless and germless, carries the spirit of the people of the glorious Hoosier State. That State which gave to the world the poet James Whitcomb Riley, the popular novelist Gen. Lew Wallace, and that great statesman and noble gentleman, Benjamin Harrison.

Michigan was wise in that generation, which one quarter of a century ago, was so practical as to pass a health law. I say that generation was practical, for what could be more practical than the application to daily life of the universally-acknowledged truth—"An ounce of prevention is worth a pound of cure".

We Americans are fond of telling how very practical we are, and we are practical on the whole, but still we waste millions of money and incalculable happiness annually, in having diseases which could be prevented. This impracticability, this failure to apply to our daily life the truths of science, seems due in part to the superstition that medicines will cure. We know very well that medicines cannot cure, that they simply stimulate or relieve, and that nature alone can cure. Yet the medicine fetish possesses us, and we pour out millions annually, for drugs. Dr. Frank Crane remarks: "The whole earth teems with advertised remedies. The landscape blossoms with them; the bill boards glow like Italian sunsets. Whole editions of dailies, weeklies and monthlies are turned into bulletins for them. We have remedies from animals, from vegetables, and from minerals. From the pines of the north and the common smart weed which flourishes in every fence corner, are extracted juices which will cure any and all diseases in seven minutes by the watch.

Cures there are by magnetism, by electricity, by faith, by christian science, by menti-culture, by laying on of hands, by osteopathy, allopathy, homeopathy, hydropathy and just plain mud. Cures! cures! cures! are everywhere, yet disease and illness stalks in our midst like a ghost which will not down.

If Dr. Bumstein announces he has discovered a certain cure for consumption,—and we always know he has done no such thing,—the tidings are borne upon the wings of lightning, editorials appear for the nine thousandth time hailing the glad news, and immediately thousands rush for the nostrum, pouring out their gold in yellow streams. Disappointment, despair and frequently ruin, follow this awful foolishness. Yet a people which brags of being very practical continues the foolishness. Even councils of great cities, councils composed of so-called practical business men, of men who think that that money which is not spent is always saved; yet really not appreciating where true economy begins and foolish extravagance ends, refuse to take adequate steps toward prevention. In this regard, we are truly a stupid people. Think of it; we refuse or neglect to call a halt to a horrible plague which continually eats into our national vitals. A plague, which annually kills more human beings than wars, famines, and alcoholic liquors. The devastation spread by consumption is greater than that proceeding from small-pox, cholera, bubonic plague, diphtheria, scarlet fever, homicide, suicide and drowning. When, O when, will we become practical and inaugurate preventive measures? Although always hopeful, I nevertheless sometimes become discouraged at our leaden-footed progress, and frequently am reminded of the story of the multiple marriages, told of Dr. Samuel Johnson. "Dr. Johnson", said Boswell, "you remember Lovett of Ludgate do you not?" "Yes, sir", replied Johnson, "I remember him well, what of him"? "Well sir, he has been four times unhappily married and now is to be married the fifth time, and what do you say to that"? "Well sir", said Johnson in his pompous way, "I denominate that the triumph of hope."

The Michigan State Board of Health and its very able secretary are

not only an honor to Michigan, but to the whole country. The health work done in Michigan has brought high reputation and honor to the State. May it continue with increasing support.

Chairman Wells—We expected to meet tonight the editor of the journal which represents the American Medical Association, Doctor John B. Hamilton, Ex-Surgeon General of the U. S. Marine Hospital Service, whose active labors in that service, together with his work as editor of the Journal, have placed him high in the ladder of fame. Unfortunately he is unable to be present with us tonight, and I will request Judge McAlvay to read a telegram from Doctor Hamilton. The telegram is as follows:

Chicago, Ill., Aug. 9, 1898.

Doctor Henry B. Baker, Secretary State Board of Health, Cadillac Hotel, Detroit, Michigan:

Deeply regret unavoidable detention. I congratulate you and your Board on quarter century's magnificent record. Well done good and faithful servants.

JOHN B. HAMILTON.

Chairman Wells—This concludes this portion of our evening program. Mayor William C. Maybury, the Reception Committee, members of the Michigan State Board of Health and distinguished visitors will now hold a reception in the corridor adjoining this room, after which refreshments will be served in the main dining room of the hotel, to be followed by short speeches from several distinguished citizens.

In concluding our exercises here, I desire on behalf of the members of the State Board of Health to thank the citizens of Detroit and the various committees appointed by them for their efforts to render this celebration successful. I also desire to thank the many friends of this Board for the kind words they have spoken today concerning the work of the Board and its Secretary, Doctor Baker. Your presence on this occasion, together with your appreciative utterances, have rendered this celebration of our quarter centennial a day long to be remembered.

RECEPTION.

The receiving party were—Hon. William C. Maybury and Miss Guinness, Doctor Leartus Connor and Mrs. Connor, Doctor Wm. Bailey and Mrs. Bailey, Doctor Benjamin Lee and Mrs. J. E. Emerson, Doctor Henry B. Baker and Mrs. Baker, Doctor Felix Formento, Doctor C. A. Lindsley, Hon. Frank Wells, Prof. Delos Fall, Judge Aaron McAlvay, Doctor Fred Belknap, Doctor Samuel G. Milner, Doctor Frederick G. Novy.

The visitors were presented to the receiving party by: Doctor E. S. Sherrill, Doctor C. W. Hitchcock, Roberts P. Hudson, and Theo. R. MacClure.

After the reception in the corridor, the guests were ushered into the main dining room of the Hotel Cadillac, where dainty and appropriate refreshments were served.

AFTER-DINNER SPEAKING.

At the close of the refreshments, Hon. William C. Maybury, Mayor of Detroit, addressed the guests with one of his characteristic after-dinner speeches, and introduced Judge Aaron V. McAlvay, member of the State Board of Health, who had been selected to act as toastmaster. Judge McAlvay presided, and with appropriate remarks introduced Doctor Leartus Connor, and Dr. E. S. Sherrill, who, on account of the late hour, were the only speakers. It is to be regretted that Doctor Sherrill's remarks cannot be here reproduced, but Doctor Connor's were as follows:

LEARTUS CONNOR, A. M., M. D., DETROIT, MICHIGAN.

In the early seventies at a meeting of the Michigan State Medical Society, I became acquainted with a tall, pale-faced, dark-eyed young doctor. His head was full of vital statistics, and the mathematics of public-health questions. On all available occasions he sought to enlist my co-operation with his aims and work, finally taking me to a little room in Sweet's Hotel he exhibited his work, by means of diagrams, figures, etc. Later, he left the service of the Secretary of State, after securing the enactment of laws providing for the collection and publication of vital statistics. These laws were the best possible at that date, but he has ever since lent his cordial aid to promote their improvement, until in the department of death registration it is as perfect as practicable.

He was the moving spirit in the establishment of the Michigan State Board of Health, and to the present has been its guiding genius. His Board has at divers times had representatives from doctors, lawyers, ministers, business men, professors, but as a whole they have heartily seconded his plans, and brought to their success all of power they possessed. From its inception the Michigan State Board of Health has been a unit, clustering about this pale-faced student of public health as soldiers about a general, as sailors about a captain, as branches about the tree's trunk. Together they have studied the problems of public health as found in Michigan, and together they have applied them for the benefit of all the people—all have rejoiced in the gradual diminution of sickness and mortality of our people, and in their increased physical vigor.

It is pertinent to quote from the lips of the late Dr. Bowditch, founder of the Massachusetts State Board of Health, the statement that the work of our pale-faced student friend was easily first of its kind, and that to it he always turned for aid, with the assurance that, it exhibited the highest skill, the most uncompromising accuracy, and devotion to the cause of public health.

In one respect the work of the Michigan State Board of Health has been notable, viz: its absolute freedom from any taint of corruption. During a quarter of a century it has kept its aims fixed upon the advancement of public health, undisturbed by personal ambition, or other entanglements. Its earnest Secretary, forgetting personal considerations, has given his life to the advancement of the physical well being of our people. It could not be otherwise than that such a life would meet antagonisms, but it has never been my lot to meet any to controvert his single-hearted devotion to the interest of Michigan's citizens.

It must be confessed that public-health service in Michigan has failed of such recognition as its merits deserved; far too little financial support has been accorded, but it is believed, that year by year the people will so increase in knowledge as to instruct their legislative representatives to give the State Board of Health all that support, needful for the protection of the health and lives of its citizens.

It gives me pleasure, to direct attention to the spirit which originated, and thus far guides the operations of the Michigan State Board of Health; to note its devotion to the science of Sanitation; its freedom from political or other entanglements; and to say that the pale-faced friend of a quarter of a century ago, now in the prime of matured life, still leads, and is well known to all as the earnest student, the distinguished sanitarian, the clean citizen, the true man—Dr. H. B. Baker.

The meeting broke up at a late hour, and thus ended the proceedings of the quarter-centennial celebration of the establishment of the Michigan State Board of Health. However, most of the visitors to Michigan remained to attend and take part in the proceedings of the annual meeting of the Conference of State and Provincial Boards of Health of North America, whose program had been arranged to occupy the succeeding two days. The subjects discussed at the Conference were of immense import. The proceedings will be published, and any one wishing a copy can probably purchase one from J. N. Hurty, M. D., Sec. Conference of State and Provincial Boards of Health, Indianapolis, Indiana.

VISIT TO PARKE, DAVIS & CO., AND RIDE ON DETROIT RIVER.

The records of so important a meeting and such an enjoyable time would not be complete without mention of the visit to the plant of Parke, Davis & Co., one of the largest manufacturing establishments for medical supplies, antitoxin, etc., in the world, and whose biological department is extensive and unique. Those wishing to avail themselves of this opportunity were taken by street car to this establishment. Upon arrival, they were received by Mr. Parke and his able corps of assistants, were served with an elaborate luncheon, after which the factory was thoroughly inspected, including the several branches of the biological department, in which hundreds, even thousands of animals, are used for the production of antitoxins for diphtheria and other diseases.

The citizens of Detroit had provided for a boat ride on the charming Detroit river, and the steamboat was waiting at the dock of Parke, Davis & Co. The boat ride occupied the remainder of the afternoon, and the afternoon entertainment ended with refreshments at the pavilion of the Wayne Hotel.

All pronounced the entertainment a success, the visit to Parke, Davis & Company's establishment very instructive, and extended their thanks and best wishes to Parke, Davis & Co. and to the members of the local committee of citizens which had provided so enjoyable an event, as well as for the pleasant and very successful transaction of the business of the quarter-centennial meeting.

Later, the State Board of Health formally and unanimously adopted a vote of thanks to the members of the local committees for their very successful efforts for the good of the quarter-centennial celebration.

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